Reading Printed versus Online Texts. A Study of EFL Learners' Strategic Reading Behavior

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ABSTRACT

With the development of the WWW and Internet, hyperreading has become an issue for discussion in the educational field and more specifically in the field of English as a second or foreign language. Yet, very little is known about its nature concerning the reading process. Therefore, the purpose of this paper is twofold: first, to examine whether the hypertextual medium affects learners' reading comprehension and, second, to analyze learners' use of strategies in hard copy and online reading contexts. Fifty university students from the discipline of Tourism read a research article in English taken from an online journal. Half the students (n = 25) read it in a printed format and the other half (n = 25) read it in its online version. Materials included an English academic reading test to measure learners' comprehension of the academic passage and a reading strategy questionnaire to determine which strategies were employed by students. Statistical analyses revealed that the hypertextual medium 1) did not affect learners' overall reading comprehension, and 2) promoted the use of reading strategies, including both top-down and bottom-up strategies. These results are discussed and suggestions for further research are given.

KEYWORDS: English for Tourism, reading comprehension, reading strategies, hyperreading

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I. INTRODUCTION

As acknowledged by many researchers (Anderson, 1999; Ediger, 2006; Grabe & Stoller, 2001; Grabe, 2006; Koda, 2005; Usó-Juan, 2007), teaching second/foreign language (L2) readers how to use strategies should be part of every reading lesson. The term reading strategies refers to those conscious or unconscious procedures, actions, techniques or behaviors that learners employ in order to enhance their comprehension and make up for interpretation problems (O'Malley & Chamot, 1990). Following Abbott (2006: 637) reading strategies can range from bottom-up (or local) to more top-down (or global) strategies. On the one hand, bottom-up strategies focus primarily on word meaning, sentence syntax, or text details and are associated with attending to lower cues. Examples of bottom-up strategies could include: scanning for specific details, paraphrasing the original text, looking for key vocabulary or phrases, or guessing unknown words, among many others. On the other hand, top-down strategies focus primary on text gist, background knowledge, or discourse organization and are associated with attending to higher level cues. Examples of commonly identified top-down strategies include: recognizing main ideas, integrating scattered information, drawing on inference or recognizing text structure, among others.

Research into L2 reading strategies carried out during the last thirty years has revealed differences in strategy use of more and less proficient L2 readers. The widely cited study by Block (1986), for example, compares strategy use by adult native and nonnative English-speaking college learners enrolled in remedial reading courses. Results show that four main characteristics distinguish more proficient readers from less proficient readers, namely the ability and predisposition to: 1) integrate information; 2) recognize aspects of text structure; 3) use general knowledge, personal experiences and associations; and 4) respond in an extensive mode rather than in a reflective or personal mode. The study conducted by Chamot and El-Dinary (1999) involving young learners in elementary French, Japanese, and Spanish immersion classrooms also reflects a dominance of background knowledge strategies (including interferences, predictions and elaborations) among high-achieving learners. Results from the studies by Block (1986) and Chamot and El-Dinary (1999) are significant because they revealed that across age levels good readers favor top-down strategies.

However, as shown by Anderson (1991) the use of certain strategies does not necessarily account for the effectiveness of reading comprehension. What matters is the skilful use of clusters of strategies. In fact, in his study with adult English as L2 learners he

finds that the use of more reading strategies correlated with higher reading scores. This author highlights the importance of *orchestrating* the use of a set of reading strategies to obtain meaning from the text. In our understanding and following Ediger (2006), the term *orchestrating* must be understood as the capacity good readers have to strategically select and employ specific strategies while reading a text in order to enhance their reading comprehension process. Good readers, thus, are those able to become *strategic*, which as summarized by Ediger (2006: 310), means that they: i) focus on meaning; ii) have a purpose for reading and tailor strategies to tasks; iii) overview a text to identify the most relevant portions; iv) use multiple strategies and evaluate their effectiveness; v) use prior knowledge to make sense of the text; vi) make effective use of "higher level thinking" vii) make use of varying strategies for handling unknown vocabulary or viii) differ in their use of strategies, depending on their gender, language and cultural background, age, beliefs motivation or learning styles, among many others. In addition, it might be said that teaching learners to use reading strategies helps learners to improve their performance on test comprehension and recall (Auberbach & Paxton, 1997; Carrell, 1989; Carrell, Pharis & Liberto, 1989; Salataci & Akyel, 2002; Song, 1998).

Viewed collectively, these research findings suggest that good readers favor particular patterns of strategy use and that reading strategy instruction should be taken into consideration when teaching to read. However, the above research only focuses on what readers do while reading a printed text. The extent to which these findings can be generalized to hyperreading is still uncertain.

I.1. Strategies for Hyperreading

With the development of the Word Wide Web (WWW) and the Internet more and more texts are now processed on screen (e.g., online newspapers, journals, magazines, wikipedia articles or web pages in general, among others). Consequently, hyperreading has become an issue for discussion in the educational field and more specifically in the field of English as a Second (ESL) or Foreign Language (EFL). There has thus been an interest in making predictions about the nature of hyperreading and researching into whether reading hypertextual documents should be considered a new mode of reading

In this regard, researchers in the reading field (Burbules, 1996; Hanson-Smith, 2003; Kasper, 2003; Villanueva et al., 2008) have considered hyperreading as a reading practice that is different to that of reading in print. A key difference between the two kinds of reading is

considered to be rooted in the nature of hypertext, which challenges the presumption of the linearity observed in traditional reading. In fact, the presentation of information in digital contexts is non-linear or multi-linear (Bolter, 1998) since it is organized in a semantic network in which different related passages are connected to each other by means of keyword links (i.e. nodes) that allow readers to make directional choices appropriate to their own interest (Caballero & Ruiz-Madrid, 2006). Accordingly, a single text can afford different access routes and, therefore, different reading options. In this sense, the hypertextual nature fosters a flexible pattern of discovery which promotes greater cognitive effort on the part of readers since they have to construct information frameworks based on the nature of the paths chosen (Spires & Estes, 2002). Thus, hypertext has many advantages as a valuable instructional tool to develop learners' reading skills, since it may help teachers devise truly interactive language-learning systems susceptible to being adapted to diverse learning needs and styles.

However, some researchers warn that the nature of hypertext also has many disadvantages for readers. These disadvantages derive from the medium itself, and include disorientation in poorly designed systems that lack context clues (Conklin, 1987; Morrison, 2001; Toffer, 2000), information overload and confusion (Kasper, 2003) and problems associated with reading from the screen (i.e. screen resolution, eyestrain, screen glare, among others), all of which make digital reading more difficult (Morrison, 2001).

Given the increasingly important role of hyperreading in the academic field together with the reported advantages and disadvantages that the nature of hypertext offers, much could be gained by analyzing the ESL/EFL learners' mental processes while reading a hypertext in order to better train learners in online reading tasks. One of the few studies that have focused on this area of research is that conducted by Anderson (2003). In his study he analyzed the type of online reading strategies used by ESL and EFL learners and explored the possible difference, if any, between these two groups of learners in their choice of reading strategies. Participants in the study, after being engaged in a variety of online reading tasks, took an online survey of reading strategies which included three main types of strategies, that is, *global reading strategies* (such as having a purpose in mind or thinking about what one knows in order to help understand reading, among others); *problem solving strategies* (such as adjusting reading rate or rereading difficult text, among others); and *support reading strategies* (such as taking notes or reading aloud, among others).

Regarding the type of reading strategies used by both groups of learners, data reported that eight out of the top twelve strategies used by readers were *problem solving strategies*. As regards possible differences in strategy use between the two groups of learners, results showed that there were more similarities between EFL and ESL readers than there were differences. Overall no differences were found in the use of *global reading strategies* and *support reading strategies* between these two groups. The only difference found between the both groups was in the use of problem-solving strategies, which were more frequently used by EFL learners. The similarities between the two groups of readers were interpreted by the researcher as being due to increased opportunities for EFL learners to be exposed to English through the radio, television and the Internet, thus highlighting the importance of revisiting the EFL/ESL distinction. Anderson (2003) concluded his study by emphasizing the important role of metacognitive reading strategies in hyperreading and making explicit reference to the need to conduct further research into hyperreading. In particular, he stated the urgent need to gather reading strategy data from readers in online and in hard copy contexts in order to gain a better understanding of the possible differences or similarities between these two reading contexts.

I.2. Purpose of the present study

Bearing in mind the ideas outlined above, the purpose of this paper is twofold: first, to examine whether the hypertextual medium affects learners' reading comprehension, given the disadvantages that this medium presents and, second, to analyze learners' use of strategies in hard copy and online reading contexts in order to shed some light on hyperreading strategy training, given the increasing recognition of online reading in the academic field.

II. METHOD

II.1. Participants

Initially, the pool of participants consisted of 154 first and second year Spanish-speaking undergraduate students enrolled in the Tourism degree course at the Universitat Jaume I in Castellón, Spain. All students were engaged either in a first ($n = 82$) or second year ($n = 72$) English for Academic Purposes (EAP) course and both courses were taught by one of the researchers of the study. Each of the classes met twice a week for 120 minutes each day throughout a semester. Out of this pool of 154 students, 50 female students with a lower intermediate proficiency level were selected (Council of Europe Level=B1). Only female

students were selected in order to avoid the effect of extraneous variables on the study. Their English proficiency level was estimated from their scores on the ALTE level test (2001).

This final pool of 50 subjects was divided into two experimental groups: Group A (*n* = 25) and Group B (*n* = 25). Group A comprised second year students who read the text in print, their average age being 20.5, and Group B was made up of first year students who read the text on screen (i.e. hypertext), their average age being 19.5.

II.2. Materials

Materials for the present study included: a) an English for Academic Purposes (EAP) reading test to measure learners' reading comprehension in both formats, namely, a PDF printed version and a hypertextual one, and b) a reading strategy questionnaire to determine the strategies employed by learners.

II.2.1. EAP Reading test

All participants took a discipline-related EAP reading test which contained a reading passage from the area of tourism. This reading test took place in a 4-hour session with a 15-minute break halfway through it. The reading passage was entitled *Tourists' appreciation of Maori culture in New Zealand* by McIntosh (2004), and followed the textual conventions of a research article. This paper is from the refereed online journal *Tourism Management* and it explores the nature of demand for indigenous tourism with particular attention to the appreciation of indigenous culture gained by tourists. In order to do this, the article focuses on international tourists visiting New Zealand in order to examine tourists' motivations, perceptions and experiences of Maori culture.

This research article affords two different options for reading it. On the one hand it can be read on paper. In order to do so, readers have to select the PDF version of the article and print it. On the other hand, readers can read the text in its online version. This version contains the same information as the PDF one, but hyperlinked. In this sense, the headings of different sections in the printed version become the heading links to access the specific parts of the article in the online version. Additionally, the bibliographic references contained in the text of the online version also become nodes that are linked to the specific reference in the *reference section* of the article.

The hypertextual structure of the article, thus, cannot be considered a complex one. In fact, none of the hyperlinks contained in the online version of the article are images or take the reader to external references. However, we consider this option valid for the purpose of our study since a too-complex hypertext often does not have any printed version because of its complexity in terms of design and structure. Furthermore, the presence of numerous links in a same text can lead to cognitive overload and make learners feel frustrated and lost when completing the reading comprehension task.

To measure the reading comprehension of the passage we used two different tasks which posed questions about *literal comprehension* (Nutall, 1996: 188), i.e. "questions whose answers are directly and explicitly expressed in the text". However, the forms of the questions varied in the two tasks, since there is no perfect method of testing reading (Alderson, 2000). In the first task, we used True/False questions. Students had to read five statements and decide whether they were true or false according to the information in the passage. In order to diminish the chances of guesswork, the instructions for the task explained to the students that when giving a positive answer they had to provide the part of the text where the information was obtained. In the second task, we used open-ended questions. Learners were asked five questions which required them to think things out for themselves in order to give an answer. Instructions for the task informed students they could provide the answers in Spanish since students at this proficiency level usually understand the text but are not able to write the answers in the target language.

Additionally, and in order to get qualitative information about the students' perceptions on hyperreading, the group of students who read the passage on screen answered the following three questions: *Question 1*: Are you familiarized with the act of reading on screen with hyperlinks? If so, which hyperlinks? *Question 2*: Do you think hyperlinks have helped you to better understand the text? If so, explain how; *Question 3*: Would you have preferred to read the passage in print? Why or why not?

II.2.2. Reading strategy questionnaire

To determine the sort of strategies used by students who read the passage on screen and with hyperlinks and those who read the passage in print in PDF format, a reading strategy questionnaire (see Appendix) adapted from Janzen and Stoller (1998: 256) and Grabe and Stoller (2002: 209) was administered to the readers. Out of these two basic taxonomies of

strategies used by expert reading behavior we elaborated a single taxonomy taking into account our own experience in helping students to become strategic readers.

Our taxonomy therefore, included all strategies stated by Janzen and Stoller (1998) except that we grouped the two strategies of "previewing" and "predicting" as just one strategy, since we believe the reader uses them in conjunction when reading and we split their proposed strategy of "checking predictions or finding an answer to a question" into two different strategies in line with Grabe and Stoller (2002), since "predicting" and "questioning" imply different actions when reading. We also took the strategy of "looking up a word in a dictionary", included in the list proposed by Grabe and Stoller (2002) since we wanted to observe how the reading context affected its use. However, we did not consider the remaining two strategies proposed by Grabe and Stoller (2002), namely those of "using discourse markers to see relationship" and "taking steps to repair faulty comprehension". The former because it demands a high level of proficiency and the proficiency level of our students was lower intermediate, and the latter because it may include, for example, the strategy of "rereading", already included in their list. Therefore, we deleted the strategy of "taking steps to repair faulty comprehension", we kept that of "rereading" and incorporated three more strategies that could also be considered as strategies that may help students to understand what they read. These strategies were those of "guessing unknown words in context", "having a general look at the text to know what type of text you are going to read" and "underlining" (for the group who read in print) versus "highlighting in color" (for the group who read on screen). Table1 shows the fourteen strategies included in the questionnaire students completed, together with the description of the strategy.

Strategy (Str)	Description of Strategy*
Str1=Identifying a purpose for reading	The reader defines a purpose for reading a given text.
Str2=Having a general look at the text to know what type of text you are going to read	The reader examines the headings and subheading to have a previous idea about what the text is going to be about.
Str3=Previewing/ Predicting	The reader examines a text before reading by looking at portions of the text and then predicts what the text is going to be about.
Str4=Asking questions	The reader asks questions of the text or the author of the text.
Str5=Checking your prediction	The reader notes whether his prediction was correct or incorrect.
Str6=Finding answers to a question	The reader notes whether the question posed by himself/herself has been answered.
Str7=Connecting text to background knowledge	The reader connects information on the text with his previous knowledge about the particular content.
Str8=Summarizing	The reader reiterates what a portion of text is about by restating the main ideas.
Str9=Connecting one part of the text to another	The reader connects the part of the text being read at that moment to text that was read previously.
Str10=Paying attention to text structure	The reader thinks about his knowledge of text structure and uses that knowledge to comprehend the text.
Str11=Rereading	The reader rereads the text for a purpose.
Str12=Looking up a word in a dictionary	The reader looks up a word in a dictionary to help him understand what he reads.
Str13=Guessing unknown words in context	The reader guesses unknown words to help him understand what he reads.
Str14=Other (e.g. "underlining", for those students who read in print or "highlighting in colours" for those who read on screen).	The reader underlines/highlights information to help him remember it.

*Note. The strategies taken from Janzen and Stoller (1988: 256) follow the description provided by them.

Table 1. List of Reading Strategies Incorporated in the Students' Questionnaire

II.3. Data collection procedures

Experimentation was divided into two four-hour sessions that took place on two consecutive days (one for each group) in either a language learning laboratory, for students who read the passage in print, or in a computer laboratory, for students who read on screen. In each session students first completed the reading comprehension test and then, during the last 15 minutes of the session time, students completed the reading strategy questionnaire. The

activity had to be carried out outside participants' regular class hours because the time required to complete all tasks exceeded the limits of their class time. To guarantee consistency of procedure, the two researchers of the study monitored the whole research process.

To ensure that participants were familiar with the act of using strategies and were more aware of the strategies that they used while reading, the teacher (one of the researchers involved in the study) of each group engaged the participants in two two-hour strategy training sessions which were conducted in the class time of each group. These two sessions were scheduled in two consecutive weeks prior to the testing session. In the first session, students were introduced to the first seven strategies presented in the list of broadly applicable strategies and in the second session they were introduced to the rest of the strategies (see Table 1). In both sessions, the teacher included a discussion on the nature of strategic reading and provided explicit instruction on how and when the reader could use the particular strategy (see Anderson, 1999 or Carrell & Grabe, 2002) for more details on how to conduct this general strategy discussion). In addition, both sessions included teacher modeling of expert reading behavior. In doing this, the teacher read aloud a portion of the passage that was specific to the field of tourism, and, as she was doing so, she was thinking aloud (see Janzen & Stoller, 1998 or Janzen, 2002, for more information on how to use think-aloud protocols).

II.4. Scoring procedures

The first task, the True/False activity, had a total of five test items and each item was assigned 10 points. The second task used five open-ended questions and they were marked using a scale adapted from Dole *et al.* (1991), but modified to suit our study because the open questions posed for the present study did not require inferencing as in the study by Dole *et al.* (1991). The scale employed to mark the questions was as follows: 10-point responses included all text-based information necessary for a complete response; 5-point responses included only part of the correct text-based information necessary for a complete response, 0-point responses included incorrect text-based information. Therefore, the scoring scale for the reading test was between 0 and 100 points. The two researchers independently coded the second reading comprehension task and the rate of agreement was very high (96%). Any disagreements were resolved through discussion.

II.5. Statistical analysis

To determine what kind of statistical analyses had to be carried out, it needs to be noted that, first, we examined normality of data distribution with the Kolmogorov-Smirnov test. Results showed that we could not assume normality in the distribution of scores on the reading comprehension test (p=0.001) but it could be assumed (p=0.3) on the distribution of data from the reading strategy questionnaire.

In order to address the first research question of the study, which referred to the effect of the textual medium on learners' EAP reading comprehension, scores on the reading comprehension test for students who read in print and those who read on screen were compared using a Mann-Whitney U test.

In order to address the second research question of the study, which referred to the effect of the textual medium on learners' use of reading strategies for academic reading comprehension, the mean scores of strategies used by students who read in print and those who read on screen was carried out using a *t* test. Additionally, a Chi-square test with Yates's correction was used to compare the frequency of the fourteen strategies employed by the two groups of students (expected counts were all higher than 5).

The SPSS (Statistical Package for Social Sciences) statistical program was used to analyse the results (Ferran, 1996). The level of significance was set at 0.05 for all statistical analyses.

III. RESULTS

III.1. Effect of the hypertextual medium on reading comprehension

The first research question asked whether the hypertextual medium has an effect on EFL learners' reading comprehension. As shown in Table 2, the mean score of reading comprehension (out of a maximum score of 10) for students who read in print and with a PDF format and those who read on screen with hyperlinks is very similar (in the print group, $n = 25$, $M = 6.22$, $SD = 1.45$; on screen group, $n = 25$, $M = 6.48$, $SD = 1.85$), the differences were not statistically significant (U value $= 267.500$, $p>0.05$). These findings, thus, demonstrate that in our study the hypertextual medium did not affect learners' overall reading comprehension.

Group	n	Mean	SD	U	p
In print	25	6.22	1.45	267.500	.373 (ns)
On screen	25	6.48	1.85		

Table 2. Reading Comprehension of each Group. Mann-Whitney U test.

Additionally, we checked the answers to the three questions aimed at gathering qualitative information about learners' attitudes toward hyperreading. These questions were only answered by the group of students who read the text on-screen with hyperlinks. Table 3 presents the frequency data for the fixed choice questions and shows that 68% of the students were not familiarized with the act of reading on screen with hyperlinks. However, and despite this fact, 68% of the students had the feeling that hyperlinks had helped them to understand the text better and 64% of them preferred to read the passage on screen rather than in print.

Screen Group (n=25)				
	Response			
Questions*	Yes	%	No	%
Question 1	8	32	17	68
Question 2	17	68	8	32
Question 3	9	36	16	64

*Note. Key to questions: *Question 1*: Are you familiarized with the act of reading on screen with hyperlinks? If yes, which hyperlinks? *Question 2:* Do you think hyperlinks have helped you to better understand the text? If yes, explain how. *Question 3:* Would you have preferred to read the passage in print? Why or why not?

Table 3. Responses to Questions about Hyperreading Given by the Screen Group

III.2. Effect of the the hypertextual medium on learners' use of strategies

The second research question focused on identifying whether the hypertextual medium has an effect on EFL learners' use of strategies. In order to answer this question we first compared data to determine whether there was any difference in the mean scores of strategies used by students who read in print and those who read on screen, and then we examined differences between the particular use that both groups of students made of the fourteen broadly applicable strategies included in the students' questionnaires.

Descriptive statistics of the average number of strategies used by both groups of students are presented in Table 4. These results illustrate that the group of students who read in print employed less reading strategies (M = 7.72, SD = 1.70) than the group of students who read on screen (*M* = 9.52, *SD* = 1.73), the differences being statistically significant (*t* value = -3.709, *p*<0.05).

Group	*n*	M	SD	t	df	*p*
In print	25	7.72	1.70	-3.709	48	.001
On screen	25	9.52	1.73			

Table 4. Mean Comparison of Strategies Used by Both Groups. *t* test.

With regard to the particular use the two groups of students made of the fourteen strategies, we found no statistically significant differences in the use of all strategies except for four of them (see Table 5), namely, strategy 4, i.e., "asking questions" (in print, *n* = 1; on screen, *n* = 10; χ^2 value = 9.441, *p*<0.05), strategy 6, i.e. "finding answers to a question" (in print, *n* = 2; on screen, *n* = 18; χ^2 value = 21.333, *p*<0.05), strategy 13, i.e. "guessing unknown words in context" (in print, *n* = 1; on screen, *n* = 18; χ^2 value = 24.533, *p*<0.05) and strategy 14, i.e. "underlining" for students who read in print or "highlighting in colors" for those who read on screen (in print, *n* = 23; on screen, *n* = 13; χ^2 value = 9.921, *p*<0.05).

Strategy	In print (n = 25)		On screen (n = 25)			
	n	**%**	**n**	**%**	**χ^2**	**p**
Str1	18	72	21	84	1.049	.306 (ns)
Str2	18	72	22	88	2.000	.157 (ns)
Str3	6	24	11	44	2.228	.136 (ns)
Str4	1	4	10	40	9.441	.002
Str5	5	20	10	40	2.381	.123 (ns)
Str6	2	8	18	72	21.333	.000
Str7	15	60	15	60	.000	1 (ns)
Str8	19	76	21	84	.500	.480 (ns)
Str9	18	72	12	48	3.000	.083 (ns)
Str10	19	76	19	76	.000	1 (ns)
Str11	24	96	23	92	.355	.552 (ns)
Str12	24	96	25	100	1.020	.312 (ns)
Str13	1	4	18	72	24.533	.000
Str14	23	92	13	52	9.921	.002

Table 5. Frequency and Percentage of Strategies Used by both Groups. Chi-square test with Yates' correction.

IV. DISCUSSION

IV.1. Effect of the hypertextual medium on reading comprehension

Regarding the effect of the textual medium on learners' EAP reading comprehension, statistical analyses revealed no significant difference between both groups despite learners' lack of experience in the act of reading on screen (i.e. only 32% were familiarized with hyperlinks), which, supposedly, might have involved some difficulties and misunderstandings during learners' reading act. This result might be due to two main reasons, namely, a) the simple structure of the hypertext chosen for the present study, and b) the fact that learners who read on screen employed more reading strategies than those who read in print in order to (presumably) cope with the difficulties inherent to the hypertextual medium.

Concerning the structure of hypertext, a basic hypertext type might prevent learners from becoming frustrated and eventually dropping out of the task. As we understand it, a more complex structure could have affected learners' text comprehension, since disorientation

and cognitive overload (Conklin, 1987) triggered by the presence of multiple links can actually become obstacles in the reading comprehension process, since learners are not trained to manage the complexity of such hypertexts and therefore, distract them from their main goal, which happens to be comprehension of the text and not struggling with technological literacy. Additionally, the basic structure of the hypertextual version might contribute to the fact that most students (68%) perceived the links as helpful in order to achieve better text comprehension, which (despite learners' lack of experience) might show learners' favorable attitude toward the use of technology in an EFL reading context. Despite learners' tendency to be technology-friendly because of their age (these learners belong to the *technological* generation), their positive attitude towards links and the hypertextual structure might be considered to be a result of the cognitive flexibility that hypertext allows for (Anderson, 2003). Learners might feel more comfortable when faced with a text in which linearity is not an issue, that is, the hypertext has no starting point, no finishing point, and consequently can be handled in different ways. Indeed, when they were asked whether they would have preferred a printed version of the text (i.e. without links), most of them (68%) showed a preference for the online option.

In order to deal with the second tentative reason, we need to pay attention to results from our second hypothesis.

IV.2. Effect of the the hypertextual medium on learners' use of strategies

Regarding the effect of the textual medium on learners' use of strategies for EAP reading comprehension, statistical analyses revealed that there is a significant difference in the total number of strategies used by the two groups. Thus, the group of students who read on screen employed more reading strategies than the group of students who read in print. This result, together with the result obtained from our first hypothesis (i.e. no significant difference in reading comprehension between both groups), seems to validate Anderson's (1991) findings on the close relationship existing between the use of strategies and reading comprehension in a print context. To this regard, he stated that there is a correlation between the strategies learners use and the reading scores they achieve. In the present study, learners reading in print and learners reading online did not show any significant difference in their reading comprehension of the text despite the fact that those reading online had to cope with the difficulties inherent to the hypertextual medium that may presuppose worse reading comprehension results. Therefore, it seems that the use of a larger number of strategies while

engaged in hyperreading mitigated the difficulty inherent to the digital medium. Consequently, it seems logical that findings show no significant difference between both groups concerning text reading comprehension.

Furthermore, findings from this second research question go in line with Anderson's (2003) claim that online reading is a context that favors the use of reading strategies. A tentative explanation to these results might be based upon the flexible nature of hypertext itself. In fact, in its true essence hypertext not only offers multiple interaction paths to readers but also, and most importantly, the possibility of constructing them ad-hoc according to their own interests. In this sense, digital readers are afforded the opportunity to change their reading path and start another one (Caballero & Ruiz-Madrid, 2006). This flexibility inherent to the process forces readers to make a higher cognitive effort and therefore to widen the scope of strategy use and employ more strategies than they usually do in order to achieve text comprehension.

Concerning the use of particular strategies, an interesting finding in the data reported here is that there was no significant difference between the type of strategies employed by learners in both groups, except in four cases, namely, strategy 4 (i.e. "asking questions); strategy 6 (i.e. finding answers to a question); strategy 13 (i.e. guessing unknown words in context) and strategy 14 (underlining) for students who read in print or (highlighting in colors) for those who read on screen. This pattern of readers' use of strategies adds one main aspect to our understanding of hyperreading. That is, it seems that hyperreading is a text medium that fosters not just the use of more top-down strategies such as "asking questions" or "finding answers to a question" as Anderson (2003) claimed but also more bottom-up ones such as "guessing unknown words in context".

As regards the use of strategy 14 (i.e. underlining vs. highlighting) learners reading in print used this strategy more often than those reading on screen. This result might not be surprising if we take into account the lack of experience in hyperreading of the students involved in the present study, which may be linked to lack of computer expertise. Moreover, underlining on a printed document is easier and handier than highlighting on an online document. Yet, as we did not determine learners' computer expertise, we are not certain whether the technological component was an added difficulty to the group reading on the screen that made some possible contribution to this result.

V. CONCLUSIONS

The results of the current study lead to the following conclusions within the specific experiment undertaken:

1) The hypertextual medium does not affect learners' EAP reading comprehension. However, the group working with the on-screen version showed a favorable attitude toward the medium and considered hyperlinks as helpful tools for text comprehension purposes.

2) The hypertextual medium fosters strategy use. This medium, therefore, could be regarded as an effective tool for fostering learners' use of reading strategies, including both top-down and bottom-up strategies.

As with all empirical research, the present study has some limitations and provides suggestions for research to be undertaken in the future. One of the first limitations that make us cautious about the generalizability of the findings of the current study refers to the text type selected for this research. In our study we chose a research article (from a professional journal) in the students' own subject area because it is the type of text that university students are most commonly required to deal with. However, it only represents one type of text read in academic courses. Furthermore and as previously mentioned, the hypertextual structure of the text was rather simple. In this sense, future research is needed using other passages and genres, as well as more complex hypertextual structures.

A second limitation concerns the particular type of tasks selected to measure the reading comprehension of all participants. As suggested in this paper, the reading tasks used in this study have their advantages and disadvantages as testing methods. Consequently, future research may want to use other tasks to measure learners' reading comprehension.

A third limitation has to do with the participants' level of proficiency in English. In order to have an adequate number of participants for the study, and to avoid the gender effect on reading, we made the conscious decision to select low proficiency female participants because this was the proficiency level and the gender that allowed us to obtain the biggest sample of population. It should be interesting to explore whether a study with participants at different levels of proficiency and with different genders, that is, either male participants or a mixed-sex group would reveal different findings.

A fourth and final limitation concerns the fact that many participants in the study indicated that they were not familiarized with the act of reading passages on screen. For this reason, we wonder whether research with participants who are more used to the act of hyperreading would have provided us with different results.

Despite these caveats, the findings of the study reported here have contributed to the plethora of research investigating the role of technology in language learning by showing the potential of hypertexts as a textual format to develop strategic readers.

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APPENDIX
Questionnaire on Reading Strategy Use*

Student's name   _____
Age: _____

Instructions. While reading, did you use these common strategies? For the
strategies that you did use, circle YES and comment on the following question:
How did you use the strategy?

1. Identifying a purpose for reading	Yes	No
2. Having a general look at the text to know what type of text you are going to read	Yes	No
3. Previewing / Predicting	Yes	No
4. Asking questions	Yes	No
5. Checking your predictions	Yes	No
6. Finding answers to a question	Yes	No
7. Connecting text to background knowledge	Yes	No
8. Summarizing	Yes	No
9. Connecting one part of the text to another	Yes	No
10. Paying attention to text structure	Yes	No
11. Rereading	Yes	No
12. Looking up a word in a dictionary	Yes	No
13. Guessing unknown words in context	Yes	No
14. Other (e.g. underlining / highlighting in colors etc.)	Yes	No

*Note. Adapted from Janzen and Stoller (1998) and Grabe and Stoller (2002).