

ORIGINAL ARTICLE

## Strategic behavior in digital reading in English as a second/foreign language: a literature review

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### ABSTRACT

This paper aims at presenting an overview of recent studies on students' strategic behavior while reading online texts in English as a second/foreign language. As the digital environment has unique features that may influence reading comprehension, it is necessary that readers develop strategies to better cope with the online demands (Leu et al., 2014; Cho & Afflerbach, 2017). The studies here described made use of a wide range of data collection procedures, approaching qualitative and quantitative methods, by using surveys, observations, interviews and think-aloud protocols. Their findings collaborate to the understanding that Internet/hyperlinked reading is a complex cognitive process, involving not only the transfer of paper-based strategies but also mastering computer and multimedia skills.

**KEYWORDS:** reading; digital texts; strategies; ESL/EFL.

### *Comportamento estratégico na leitura digital em inglês como segunda língua/língua estrangeira: uma revisão da literatura*

#### RESUMO

Este artigo tem como objetivo apresentar uma visão geral dos estudos recentes em relação às estratégias utilizadas ao ler textos digitais no contexto de inglês como segunda língua/língua estrangeira. Como esses textos apresentam características únicas que podem influenciar a compreensão leitora, torna-se necessário o desenvolvimento de estratégias para que o leitor consiga interagir melhor nesse contexto (Leu et al., 2014; Cho & Afflerbach, 2017). Os estudos aqui descritos fizeram uso de diversos procedimentos de coleta de dados, abordando métodos qualitativos e quantitativos, por meio de questionários, observações, entrevistas e protocolos verbais. Seus resultados colaboram para uma melhor compreensão da leitura na Internet/de hipertextos como um processo cognitivo complexo, que envolve não somente a transferência de estratégias próprias de textos impressos, mas também o domínio de habilidades de informática e de multimídia.

**PALAVRAS-CHAVE:** leitura; textos digitais; estratégias; ESL/EFL.

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## 1. INTRODUCTION

With the growing use of digital spaces for educational purposes and the availability of sources of knowledge online (blogs, articles, wikis), a new demand has arisen: reading in the digital format. Online texts have become one of the main sources of knowledge for students; they have been more required to read such texts, both in the context of ESL (English as second language)/EFL (English as a foreign language)<sup>1</sup>, mainly in the academic setting (Azmudin, Nor & Hamat, 2017; Chen, 2015). In this context, educators play an essential role in familiarizing students with reading on the Internet, exploring its features so students are able to make the most of these online resources (Gilbert, 2017).

Reading on the Internet is believed to pose more challenges to comprehension, as online texts frequently undergo constant changes, interacting with multimodal features, which might distract the reader (Coiro, 2003; Leu et al., 2014; Cho & Afflerbach, 2017). These texts are usually nonlinear and interactive: they have nodes, which are interconnected and accessible through hyperlinks (Hahnel et al., 2016). When dealing with this multilayered organization, readers may lose track of reading and, as a consequence, a strategic behaviour is required so they are able to succeed when reading digital texts (Cho & Afflerbach, 2017). Locating, evaluating, synthesizing, and communicating information on the Internet are skills needed in this context (Leu et al., 2014). Traditional reading skills are also necessary when it comes to reading and learning information from the digital environment, but they do not suffice (Coiro & Dobler, 2007).

These new demands of the digital context, as well as the growing use of online materials in L2, has led researchers to investigate whether the L2 strategies applied when reading online would differ from the ones traditionally used in paper-based text (Zaki, Hassan, & Razali, 2008; Usó-Juan & Ruiz-Madrid, 2009; Tien & Talley, 2017; Gilbert, 2017). Also, as students are more often required to read more complex texts in English, such as scientific articles, a considerable amount of research has been conducted to identify readers' strategies when reading digital texts in the ESL/EFL context, mainly in university settings (Huang, Chern, & Lin, 2009; Park & Kim, 2011; Park, Yang & Hsieh, 2014; Taki, 2015; Azmudin, Nor & Hamat, 2017).

Given this background, the goal of this article is to review relevant empirical research regarding students' strategies when reading digital texts in L2 to better understand the main findings in the area. To accommodate this objective, this paper is organized in a way to: (a) address the main approaches on the nature of digital reading and reading strategies; (b) report the main research findings on readers' strategies when reading digital texts; and finally (c) draw some final remarks based on the conclusions of such studies.

## 2. DIGITAL READING OF L2 TEXTS

Generally speaking, digital reading can be seen as the process of textual comprehension that happens in the virtual environment. It differs from

<sup>1</sup> In this article, ESL, EFL and L2 will be used interchangeably.

paper-based reading for its non-linear organization, which is characterized by hyperlinks (Hahnel et al., 2016). Hyperlinks are sources of interrelated information accessible by clicking on a word. Coiro and Dobler (2007) divided them into two domains: closed hypertexts and Internet texts. The former is found in systems consisted of internal database such as CD-ROM encyclopedia or library database, among others, while the latter “refers to information (hypertext and otherwise) found within the open networked system of the Internet” (p. 220). Navigating redirects the reader to other pages which may also contain related links. Such wide myriad of possibilities require the reader to locate and select content in order to construct a coherent text base (Hahnel et al., 2016).

In print-based reading, a primary goal for readers is to build a coherent understanding of what they read (Kintsch, 1998; Kintsch & van Dijk, 1978) – and this definition encompasses the Internet context (Cho & Afflerbach, 2017). As learners read texts, they build a text base model in which written texts and images are decoded in order to comprehend the text literally. As processing moves on, readers create a situation model, which comprises the relevant information in their text base model and the reader’s previous knowledge (Kintsch, 1998; Kintsch & van Dijk, 1978).

Within this comprehension process, readers access their standards of coherence in order to check comprehension and, if necessary, apply additional processes such as making backward and forward inferences (van den Broek, Ridsen & Husebye-Hartmann, 1995). According to Cho and Afflerbach (2017), in the case of readers comprehending digital texts, they also use additional strategies to meet their own standards for coherence in order to construct a coherent understanding of the text. These additional strategies used in digital reading may include self-questioning, making connections, summarizing, among others, and will be further developed later in this paper. In this sense, learners need to develop some expertise when reading online, by using strategies to help them construct both a text base and a situation model of appropriate quality.

Reading strategies are seen as self-regulated procedures consciously applied by the reader to monitor and, if necessary, to remediate comprehension (Gagné, Yekovich, & Yekovich, 1993). Strategy choice is driven by previous successful combinations and change dynamically as comprehension problems arise during reading (Grabe, 2009). Readers often make use of good strategies but fail in monitoring this comprehension process, which includes judging progress toward reading goals and remediating by changing strategies, if necessary (Gagné, Yekovich, & Yekovich, 1993). The degree of attention dedicated to comprehension monitoring varies according to the reader’s purpose, familiarity to the topic, the textual genre, the complexity of the text, and the frequency of strategy use. Strategic behavior plays a relevant role in reading comprehension – and it encompasses not only knowing which strategies to use but also how to apply them effectively.

Pressley and Afflerbach (1995) categorize reading strategies in three general classes in relation to comprehending traditional texts: 1) identifying and learning text content (assigning importance to different parts of the text, using prior knowledge to understand vocabulary and summarizing); 2) monitoring (establishing goals, noticing progress, identifying and solving

comprehension problems); and 3) evaluating different aspects of reading (judging the suitability of the content to the task, taking a critical stance, analyzing the accuracy of information, checking for textual evidence on the claims made). Afflerbach and Cho (2010), drawing from the strategy categorization proposed by Pressley and Afflerbach (1995) and extending it to reading on the Internet and hypertexts, updated this initial framework suggesting that readers also use a fourth class of strategies: *text location*, which are needed in a larger degree in Internet reading than when reading printed texts.

More recently, Cho and Afflerbach (2017) proposed new strategies for managing online information spaces and navigating successfully by selecting useful links – an ability required for successful online reading as a process of understanding and constructing potential meanings. The authors identified three levels of coherence building in online reading: (1) information comprehension; (2) intertextual connection; and (3) construction of reading paths. The first is related to the strategies used when comprehending an online text (e.g. analyzing text information, generating inferences, evaluating whether the text meets the reading purpose, monitoring comprehension, among others), which are very similar to the ones used in traditional forms of reading. The second refers to interrelating multiple digital sources requires multiple-text linking strategies to critically compare, contrast and corroborate information across documents, to differentiate sources and to integrate content of diverse sources. The third refers to the construction of meaning through the networked information present in hypertext, which involves careful evaluation and selection of links. Readers might get lost in this process and therefore need to focus on what is relevant; this requires strategies of searching and locating information, choosing, and processing digital sources.

Influenced by Pressley and Afflerbach's (1995) notion of constructively responsive reading, Mokhtari and Reichard (2002) created the Metacognitive Awareness of Reading Strategies Inventory (MARSİ) to measure students' metacognitive awareness and perceived use of reading strategies in reading for academic purposes. Based on the MARSİ, Sheorey and Mokhtari (2001) and Mokhtari and Sheorey (2002) developed the Survey of Reading Strategies (SORS) to encompass reading in a foreign language.

The SORS, like the MARSİ, classified strategies in three groups: Global Strategies, Problem-solving strategies and Support Strategies. Global strategies involve planning, regulating and evaluating reading (e.g. activating prior knowledge, having a purpose in mind while reading and verifying whether the content fits the purpose). Problem-solving strategies are the ones used to deal with comprehension difficulty. Examples include rereading, adjusting the reading speed, paying closer attention and pausing to reflect on reading. Support strategies involve the use of reference materials as well as practical actions to retain the information read, such as taking notes, underlining important information, paraphrasing text information and using a dictionary (Mokhtari & Reichard, 2002; Sheorey & Mokhtari, 2001; Anderson, 2003).

One of the first attempts to understand the strategic behavior of L2 readers in the digital media was the work of Anderson (2003). In a large-scale study

with 247 participants, he created the Online Survey of Reading strategies (OSORS), adapted from the SORS. The objective of the study was (1) to identify the online reading strategies used by second language readers and (2) to check whether strategic behavior would differ among ESL and EFL learners. Problem solving strategies were the most frequently reported by learners; no significant difference was found between the ESL and the EFL groups concerning strategy use.

The OSORS, created by Anderson, as well as his findings have strongly influenced later studies (Ahmadian & Pasand, 2017; Azmudin, Nor, & Hamat, 2017; Chen, 2015; Taki, 2015; Tien & Talley, 2014; Usó-Juan, 2009; Zaki, Hassan & Razali, 2008; Huan, Chern, & Lin, 2009), reported in the next section. This survey was used, and eventually adapted to suit specific contexts, in order to track the strategies used by second language students while reading online. Anderson's study also emphasized the importance of metacognitive strategy awareness to second language students and the teachers' role in providing strategy training in this new online context.

### 3. READERS' STRATEGIC BEHAVIOR WHEN READING ONLINE: MAIN RESEARCH FINDINGS

In order to map the latest and most relevant findings on reading behavior in ESL/EFL reading of digital texts, twelve studies were selected from CAPES Journal Portal, available at [www.periodicos.capes.gov.br](http://www.periodicos.capes.gov.br). The selection process happened within the period of November 2017 to February 2018 and was based on the first ten pages to ensure their entire relevance to the topic in question, under the search-strings: "reading online texts in L2", "students' strategies, ESL, EFL" and "digital reading, strategies, ESL, EFL". Within them, we read the summary of the articles and selected the ones that approached strategic behavior when reading online in the ESL/EFL context. After this, the articles were read, analyzed and grouped according to their method and objectives. We chose not to distinguish between ESL and EFL contexts so that a more comprehensive overview of the object of study could be given. The results found are reported in the following paragraphs.

First, we present the results of the qualitative case studies on strategies used when reading online conducted by Park and Kim (2011, 2017) and Park, Yang and Hsieh (2014). Then, we move to studies that aimed at categorizing the reading strategies used in traditional and online reading, following Mokhtari and Reichard (2002): Azmudin, Nor and Hamat (2017); Ahmadian and Pasand (2017), Chen (2015); Taki (2015); Tien and Talley (2014); Zaki, Hassan and Razali (2008) and Huang, Chern and Lin (2009). We also include studies which had the purpose of contrasting the two modes, but used different methods: Usó-Juan and Ruiz-Madrid (2009) and Gilbert (2017). Finally, we approach other factors cited in the reviewed articles that influenced reading, like gender issues, the role of proficiency, and the influence of the readers' L1 (Ahmadian & Pasand, 2017; Tien & Talley, 2014; Chen, 2015; Huang, Chern, & Lin, 2009; Taki, 2015; Chen, 2015).

In online reading, under a qualitative orientation, Park and Kim (2011, 2017) conducted longitudinal case studies with three college-level learners and five elementary school students, respectively, utilizing methods such



as observation, think-aloud protocols<sup>2</sup> and interviews. In both studies, they revealed that, when reading online, non-native English language students used particular computer-based strategies especially developed for the online context. Readers also transferred and adjusted their paper-based reading strategies. In Park and Kim (2011) seven main strategies emerged, in which two were unique to online reading and three were transferred from paper-based reading. Similarly, in Park and Kim (2017) nine strategies were found, in which two were defined as particular to online reading and seven were adapted from paper-based reading to suit the online setting. The strategies found in these studies are displayed in Table 1.

**Table 1.** Comparison of the strategies used in Park and Kim (2011, 2017)

Strategies/Studies	Park and Kim (2011)	Park and Kim (2017)
<i>Strategies transferred from paper-based reading</i>	<ul style="list-style-type: none"> <li>– dialoguing with oneself, others and online resources</li> <li>– setting up reading purposes and planning</li> <li>– inferring</li> <li>– previewing and determining what to read</li> <li>– connecting prior knowledge and experiences with texts and tasks</li> </ul>	<ul style="list-style-type: none"> <li>– dialoguing</li> <li>– using references and sharing information source</li> <li>– previewing and setting up the purpose</li> <li>– inferring from the text</li> <li>– making a connection</li> <li>– monitoring comprehension</li> <li>– adjusting the reading pattern</li> </ul>
<i>Strategies unique to online reading</i>	<ul style="list-style-type: none"> <li>– using hypermedia</li> <li>– using computer applications and accessories</li> </ul>	<ul style="list-style-type: none"> <li>– accessing a web page</li> <li>– using computer skills and devices</li> </ul>

A comparison between Park and Kim (2011, 2017) showed that the younger learners applied two extra strategies adapted from paper-based reading: “adjusting the reading pattern”, and “monitoring comprehension”. The first strategy has not pointed out any differences in usage at home and at school, and varied according to the readers’ purpose and environment. On the other hand, the second was more often used at school, where teachers played a major role by monitoring students’ reading processes. The two strategies unique to the online setting were the same in both studies, as “using hypermedia” and “accessing a webpage”, and “using computer applications and accessories” and “using computer skills and devices” referred to the same strategies. Overall, these results corroborated to the understanding that online reading entails both paper-based reading strategies and new strategies created for this environment. Based on that, the researchers described online reading as “hybrid”: not only have students transferred their internalized strategies from paper-based to computer-based reading, but also they have adapted them to the format, terms, and nonlinearity of the online reading texts.

In another qualitative case study with seven university level L2 readers, Park, Yang and Hsieh (2014) reported the use of different types of prior knowledge in digital reading: prior knowledge of the topic; prior knowledge of Internet services and their affordances; prior knowledge of informational web structures; prior knowledge of printed text structures;

<sup>2</sup> Think aloud protocols, initially introduced by Ericsson e Simon (1980), refer to the data produced as a result of asking research participants to ‘think aloud’ as they perform a certain task such as reading or translating, among others. Basically, research participants are asked to verbalize any thoughts that come to their minds while performing a specific task. The objective of this methodology is to try to access cognitive processes as opposed to only having access to final products such as reading comprehension or the translated text.

and prior knowledge of computer skills. Thus, readers in the Park et al (2014) study seemed to transfer aspects of their strategic behavior from printed to online reading, such as activating topic-specific knowledge and knowledge of text structure. Strategies unique to the online setting, were also found: “locating information from multiple online resources”; “critically evaluating information online”; and “synthesizing information online”. Besides them, participants also made use of self-regulated strategies when reading online. These involved strategies like planning (deciding which websites to access, whether to pursue lexical or content support), predicting (making predictions about whether a hyperlink would provide the necessary information or where it would lead them), monitoring (checking comprehension and the relevance of resources found), and evaluating (determining the accuracy/bias of information).

The categorization proposed by Mokhtari and Reichard (2002) influenced some studies which aimed at labeling the strategies used by ESL/EFL readers, investigating the reported use of global, support and problem-solving strategies when reading online. Out of 12 studies, four used the OSORS for data collection, two used both OSORS and SORS to compare paper-based and online reading, and one collected data through a web-based reading program. In all of them, the participants were university/college level students. The method used in each study is in Table 2.

**Table 2.** The method used in the studies that aimed at labeling the strategies

Study	Method
Azmudin, Nor and Hamat (2017)	OSORS
Ahmadian and Pasand (2017)	OSORS
Chen (2015)	OSORS
Taki (2015)	OSORS
Tien and Talley (2014)	OSORS and SORS
Zaki, Hassan and Razali (2008)	OSORS and SORS
Huang, Chern and Lin (2009)	Web-based reading program

In the studies focusing only on reading online, which used OSORS for data collection, similar to Anderson (2003), problem-solving also revealed to be the most frequently used strategy. This finding was reported in three studies: Azmudin, Nor and Hamat (2017), Ahmadian and Pasand (2017), and Taki (2015). The use of problem-solving strategies emphasized that students engage in conscious effort to solve reading problems when reading online in L2 by getting back on track when losing concentration, re-reading a difficult text to increase understanding, reading slowly and carefully, among others. There is a chance that students preferred to use this type of strategy in the L2 context due to language proficiency constraints, as this type of strategy helps students understand information quickly.

The prevalence of problem-solving strategies makes sense for a number of reasons. First, because comprehension difficulties are more likely to arise in EFL reading. Also, in the academic setting, students are required to construct meaning from expository text – which is not the structure they are most

familiarized with. Global reading strategies involve general processes of preparing to read (e.g., setting a purpose for reading, activating background knowledge, skimming, making predictions). In comparison, problem-solving strategies are specific repair processes used when comprehension fails (e.g., checking one's understanding on encountering conflicting information, adjusting reading speed, rereading, guessing the meaning of unknown words). These two types of strategy are relatively easy to handle, as they do not involve restating ideas, for instance. Differently, support strategies comprise a wider and more complex range of actions such as using reference materials, taking notes, underlining information, paraphrasing, summarizing, discussing with others, among others. Although these are effective tools are at the readers' disposal, they involve greater effort and are more difficult to master (Mokhtari & Reichard, 2002).

Chen (2015) and Huang, Chern and Lin (2009) presented other strategies used when reading online in a second language. Also adopting OSORS, in Chen's study the findings showed a predominance of global strategies. Despite this, the most frequently used strategy was looking up at an online dictionary when reading online materials - which is a support strategy. Differently, Huang, Chern and Lin (2009) designed and developed a Web-based reading program to collect data on readers' online reading strategies regarding four strategy types (global, problem-solving, support, and socio-affective strategies). This fourth strategy was related to the use of online chat rooms, discussion boards, email services, and music boxes. The results showed that all students used support strategies most frequently (62.32%), with global strategies in second place (23.01%), socio-affective strategies in third (7.49%), and problem-solving strategies were the least used (7.18%).

Two studies compared traditional and online reading using the OSORS and SORS for data collection. They pointed out some similarities and differences in the use of strategies in these two contexts. Zaki, Hassan and Razali (2008) did not find significant differences among the types of strategy used online and offline: global strategies were the most used in both, followed by problem-solving strategies and support strategies, although in offline reading, readers tended to use more support strategies. Nonetheless, online reading involved significantly more strategies compared to offline reading. Tien and Talley (2014) reported that more problem solving strategies were used in both online and offline reading. The use of global and problem-solving strategies was higher in offline reading, as learners were probably more acquainted with this setting. The results of the study confirmed the importance of metacognitive online reading strategies among second language learners since they aid text comprehension and increase learners' reading ability.

Usó-Juan and Ruiz-Madrid (2009) and Gilbert (2017) also investigated the distinctions between onscreen and paper-based reading. In both of them, readers employed significantly more strategies in web text than in printed text. With 50 Spanish academic students, Usó-Juan and Ruiz-Madrid (2009) revealed that reading comprehension was similar between the students who read in print and online, despite the constraints the hypertextual medium supposedly imposed and the students' lack of experience in reading on screen. The types of strategy used were similar among the two groups, but



underlining and highlighting were used more often in paper, probably due to the lack of computer expertise. Although most students reported they were not familiarized with reading onscreen, they evaluated hyperlinks as helpful to comprehension, showing a positive attitude toward EFL reading in the digital medium.

In the study by Gilbert (2017), eight adult ESL learners from a private language school in Virginia (USA) participated in reading workshops, interviews, and wrote student journals for two months. The participants reported using different strategies when reading online compared to offline. The majority of them preferred to read ink print when they felt a need for in-depth or careful reading due to eyestrain and inconvenience of portability. Reading purpose affected the participants' choices: for pleasure, most of them preferred to read the text in print. However, for research purposes, learners searched online – although printed text was seen as more trustworthy. All participants also engaged in multitasking while reading online.

The researcher also listed advantages and challenges of digital reading. Among the advantages, he mentions the ease of access to online dictionaries, and the speed of locating information online. On the other hand, using a search engine to locate information and navigating through web-based text were great challenges for students. Participants showed inability to critically evaluate web text, limited knowledge on online reading strategies, difficulty in using search engines effectively, and frustration in navigating through hyperlinks. These learners, according to the author, often overestimate their online research skills, relying too heavily on tools such as Google and Wikipedia, failing in searching and evaluating information online. When reading online texts, they are usually overwhelmed navigating through hyperlinks. He also emphasized the need for teaching digital literacy reading skills, claiming that it can – and should – be done in the EFL classroom.

Overall, from these results, the strategies used when reading online texts in L2 were mixed. Concerning the OSORS and SORS, problem-solving strategies were the most used by EFL/ESL learners for online reading, while there was no unanimity among the strategies used in the studies comparing the two modes of reading. Although the strategies varied when comparing traditional and online reading, Gilbert (2017), Usó-Juan and Ruiz-Madrid (2009), and Zaki, Hassan and Razali (2008) pointed out that students made use of more strategies when reading online compared to traditional reading. Additionally, online reading also seemed to demand the use of specific strategies adapted from paper-based reading and created for this particular setting, as reported in Park and Kim (2011, 2017) and Park, Yang and Hsieh (2014).

According to Zaki, Hassan and Razali (2008), these differences between online and offline reading might be related to online reading inducing readers to employ higher level strategies. They have claimed that there are three possible reasons for this distinction. The first is the nature of online reading texts. As they are nonlinear, having hyperlinks, hypertext and multiple-media, readers need to know, use, evaluate, and manage several strategies to understand and interpret the texts, and also develop new literacies. The second is the nature of the online task, which demands readers'

ability in the new literacies. Finally, the third is the need of more active and interactive readers. When reading online, readers are expected to make decisions related to where and/or what to click, and why to select a specific information.

Besides identifying the strategies used when reading online texts, three other factors were also approached in the articles, which seemed to affect readers' strategic behavior: gender, level of proficiency, and the students' L1. Three of the studies took into account differences in gender when analyzing strategic behavior in online reading: Ahmadian and Pasand (2017), Tien and Talley (2014) and Chen (2015). Students' proficiency interfering in their strategic choices were mentioned in Chen (2015) and Huang, Chern and Lin (2009), and two studies discussed the role of readers' L1 when reading L2 online texts – Taki (2015) and Chen (2015).

Gender issues seemed to play a minor role in students' strategic reading behavior although the results were mixed. Ahmadian and Pasand (2017) concluded that there was a statistically significant difference between male and female EFL learners: the mean score of self efficacy in reading was higher for male students. The use of problem-solving and support strategies was similar across gender, but females used more global reading strategies. It was further indicated that the male participants of the study saw themselves more efficacious in reading online texts. On the other hand, Tien and Talley (2014) reported that students' gender differences played a minor role in the choice of strategies; problem-solving strategies were the most reported for both male and female participants. Finally, Chen (2015) also claimed no significant differences in terms of total strategy use were found between males and females nor difference in category of strategy used (global, problem solving and support strategies), although more strategies mentioned by females reached high frequency, suggesting that this group was more strategic.

As for students' proficiency, it tended to influence positively the strategies used to read online, varying according to their knowledge of the language. In Chen's study (2015), high level students were likely to use more online reading strategies than low level students. Among these strategies, the high proficient group used more global and problem solving strategies than low proficient students. Similar results were also found in Huang, Chern and Lin (2009). The high proficiency group also employed more global strategies than the low proficient group while the latter used more socio-affective strategies than the former. According to Huang et al, these results seemed to suggest that, when reading more challenging online texts in L2, high proficient readers can better adapt their strategies by using more global strategies to increase their comprehension.

Finally, readers' L1 also played a significant role in the strategies used to read in L2. The only study that investigated this issue was Taki (2015), but Chen (2015) also mentioned its influence in readers' strategic behavior. In Taki's research, the Iranian participants read articles in Farsi and in English and answered the OSORS for both L1 and L2, as opposed to the Canadian group which has only read and answered the questionnaire in their L1). The Iranian readers showed similar metacognitive strategies in the two languages: they preferred problem-solving strategies. Likewise, Chen (2015) explained that the participants, divided in high and low level readers, behaved in the

same strategic way probably because of their first language. These results provide an evidence of transfer when choosing their strategies, as students are used to rely on their L1 to help them during the meaning making process while reading online in L2.

#### 4. FINAL REMARKS

This paper aimed at presenting an overview of recent studies on ESL/EFL students' strategic behavior when reading in the digital environment. The topic was approached by different authors under qualitative as well as quantitative methods, providing a multifaceted view of the object of study. The aspects analyzed encompassed strategy surveying, comparisons between paper-based and digital reading, inventories of strategies unique to hypertext reading, differences between online reading strategies in L1 and L2, issues of gender and of proficiency. For that, 12 articles were chosen from CAPES Journal Portal. The selection process was based on the first ten pages to ensure their entire relevance to the topic in question, under the search-strings: "reading online texts in L2", "students' strategies, ESL, EFL" and "digital reading, strategies, ESL, EFL". Within them, the articles that approached the strategic behavior when reading online in a second/foreign language were chosen.

Overall, the results of the studies conducted by Taki (2015) and Park and Kim (2011, 2017) indicated that the majority of the strategies used by ESL/EFL students when reading online were transferred from L1 and from traditional forms of reading. Nonetheless, Zaki, Hassan and Razali (2008), Usó-Ruiz and Juan-Madrid (2009) and Gilbert (2007) highlighted that more strategies were used in the online context. Furthermore, Park and Kim (2011, 2017) and Park, Yang and Hsieh (2014) identified the use of new strategies when reading online, demonstrating that the unique features of hypertext involve higher cognitive efforts and, therefore, demand adaptations in the readers' strategic behavior. These "new strategies" were related to computer skills and navigation strategies: accessing web pages, navigating through hypermedia, and using computer applications and accessories. Also, as regards to the application of the OSORS (Anderson, 2003), there seemed to be a predominance of problem-solving strategies among ESL students in online reading, as pointed out in Ahmadian and Pasand (2017); Zaki, Hassan and Razali (2008); Azmudin, Nor and Hamat (2017); Chen (2015); Huang, Chern and Lin (2009); and Taki (2015).

These findings bring important implications for reading instruction. It is essential that teachers acknowledge the fact that reading hypertexts is a more cognitively demanding process which requires skills such as navigating through hyperlinks and constructing meaning from multiple sources. Besides, teachers need to develop students' awareness when reading digital texts by showing them that the strategies employed in this space might be borrowed from traditional forms of reading, but, many times, should be selected from a pool of specific strategies that are unique to the digital environment. In this way, fostering the students' metacognition in reading in a second/foreign language is essential to improve their competence as readers of both printed and digital texts.

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Submetido: 02/05/2018  
Aceito: 18/06/2018