(E-)READING IN A FOREIGN LANGUAGE AND DICTIONARY USE

A LITERATURE REVIEW: DOES THE MEDIUM MATTER?

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1 Have eBooks lost their shine? Why is digital literary reading not much more popular?

Over time, digital reading has become commonplace in our everyday lives, the norm for numerous activities. We read and answer to personal messages and emails without first printing them, we access newspapers and magazines online. Despite the prevalence of digital text, digital reading for pleasure is still much less popular than traditional reading from text. The 2017 report "The Book Sector in Europe: Facts and Figures"[1] realized by the Federation of European Publishers (FEP) offers a clear overview of the book market of last few years. The report shows that the digital market is estimated to represent some 6–7% of the total market in Europe, with significant differences between countries. The following graph shows the proportion of digital sales in the overall book market in some selected countries comparing the digital (in black) and print (in grey) book market. According to the FEP Report it is however hard to predict how the e-book market will develop in the coming years, as "we have passed several dates at which the demise of paper had been predicted: what is sure is that a lot will depend on

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[1] See Federation of European Publishers, *The Book Sector in Europe: Facts and Figures* (2017), <https://fep-fee.eu/The-Federation-of-European-844>, (24 August 2018).

the readers' preferences and that different supports, formats and business models are most certainly going to coexist for the foreseeable future."[2]
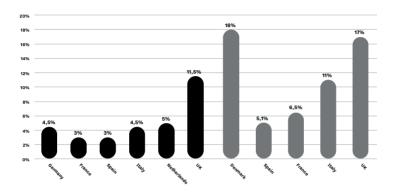

Figure 1– Federation of European Publishers 2017 Report - Note: Germany, France, Italy, Netherlands: the share of e-books refers to the trade/consumer books sector only (excluding scientific and educational books) - Due to differences in methodology, in most cases figures are not comparable between countries.

Last year, Stephen Lotinga, chief executive of the Publishers Association, stated in an article: "there is generally a sense that people are now getting screen tiredness, or fatigue, from so many devices being used, watched or looked at in their week. [Printed] books provide an opportunity to step away from that."[3] Whether this is more than a statement, needs further examination.

However, print still remains the preferred means of reading text in the educational context too and student preference

[2] Ibid., p.5

[3] See M. Sweney, "'Screen fatigue' sees UK ebook sales plunge 17% as readers return to print", *The Guardian* [online]*,* 27 April 2017, <https://www.theguardian.com/books/2017/apr/27/screen-fatigue-sees-uk-ebook-sales-plunge-17-as-readers-return-to-print>, (8 August 2018).

for print is accentuated when reading involves thorough study.[4] With her book, *Words Onscreen: The Fate of Reading in a Digital World* (2015), Naomi Baron brings more data to the case for print. In a survey of over 300 university students in the U.S., Japan, Germany, and Slovakia, the author found a common preference for print, especially for reading long texts. When students were given a choice of different media—including hard copy, cell phone, tablet, e-reader, and laptop—92% reported that they could concentrate best in hard copy. Furthermore, the American textbook publisher Scholastic found in 2015 that "nearly two-thirds of children (65%)—up from 2012 (60%)—agree that they'll always want to read print books even though there are e-books available."[5]

On the same line, results of the last four years of researches into the impact of digitisation on reading practices conducted by the members of the European research initiative COST E-READ[6] have shown that paper remains the preferred reading medium for longer single texts, especially when reading for deeper comprehension and retention, and that paper best supports long-form reading of informational text. The 2018 *Stavanger Declaration*[7], signed by over one hundred scholars and scientists, summarizes the outcomes of the COST Action concluding that the transition from paper to digital is not neutral and exhorts for caution when introducing digital technologies to education.

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[4] R. Ackerman and T. Lauterman, "Taking reading comprehension exams on screen or on paper? A metacognitive analysis of learning texts under time pressure", *Computers in Human Behavior* 28, no. 5 (2012), pp. 1816–1828.

[5] N.S. Baron, *Words onscreen: the fate of reading in a digital world* (New York: Oxford University Press, 2015); see also A. Rob, "92 Percent of College Students Prefer Reading Print Books to E-Readers", *New Republic*, 14 January 2015, <http://www.newrepublic.com/article/120765/naomi-barons-words-onscreen-fatereading-digital-world>, (18 August 2018).

[6] See E-READ COST, <http://ereadcost.eu/>, (29 March 2019).

[7] See E-READ COST, "Stavanger Declaration", <http://ereadcost.eu/stavanger-declaration/>, (29 March 2019).

Why is this the case? How can digital reading be improved? The main reasons why e-reading did not overcome reading on print might be summarized as the following:

- Implication for metacognitive performance[8] and for learning efficiency;[9]
- Pragmatic reasons to learn how to use digital devices for the long read. Screens are (still) connected with leisure time (smartphones) or work (stress), not with the long read. So, pragmatics of discourse could explain a difference: habits of reading functions;
- Disruptive effects on the reading performance linked to shallow reading;
- Influence of the digital medium on the kinaesthetic and tactile feedback provided to the reader. The haptic perception of the digital device might reduce the pleasure of reading;
- Social prestige carried by printed books in Western society;
- Implication for health such as "iPad neck", eyestrain, visual fatigue and screen-related sleeplessness.

The present article aims at contributing to the present discussion on reading on paper vs. digital reading by observing the advantages and disadvantages of paper vs. digital dictionaries for vocabulary learning in a foreign language.

1.1 Embodied feel and increased prestige of digital reading

The understanding of how reading on paper is different from reading on screens might be attributed to different causes. The first is concerned with the psychological aspects of read-

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[8] Ibid.
[9] A. Mangen, B.R. Walgermo and K. Brønnick, "Reading linear texts on paper versus computer screen: Effects on reading comprehension", *International Journal of Educational Research* 58 (2013), pp. 61–68.

ing behavior. Screens make it difficult for readers to construct an effective cognitive map, or a topography, of the text.[10] Paper books are easily navigable and offer to the reader plainly defined domains: the left and right pages, the eight corners with which to orient oneself. A reader can focus on a single page of a paper book without losing sight of the whole text; one can see where the book begins and ends and where one page is in relation to those borders. Thanks to these features it is easier to construct a coherent mental map of texts that researches have shown to have a central role in the navigational performance (i.e., searching for or locating a piece of textual information), reading speed, content recall, and reading comprehension.[11] The cognitive map is particularly important when it comes to look up a word in the paper dictionary, since one has to flip to the pages and scan through a list of words in order to find the section of interest.

Other aspects that influence the text processing are haptics and the embodiment of reading.[12] When we read a print book or on an e-reader, we engage in human–technology interactions involving the body, the mind-brain, and a technology or medium (with its interface and affordances). Movement and object manipulation might affect the reading act. Screens and e-readers fail to adequately recreate certain tactile experiences of reading on paper that many people miss and, more importantly, prevent people from navigating long texts in an instinctive and

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[10] Cf. S.J. Payne and W.R. Reader, "Constructing structure maps of multiple on-line texts", *International Journal of Human - Computer Studies* 64, no. 5 (2006), pp. 461–474.
[11] Ibid.
[12] A. Mangen and T.S.S. Schilhab, "An embodied view of reading: Theoretical considerations, empirical findings, and educational implications", in *Skriv! Les!*, eds. S. Matre and A. Skaftun (Akademika, 2012), pp. 285–300; A. Mangen, "Hypertext fiction reading and immersion", *Journal of Research Reading* 31, no. 4 (2008), pp. 404–419.

enjoyable way.[13] Subjects of a study reported "feeling awkward while manipulating the iPad during reading."[14] Readers can feel disoriented because they miss the typical experiences related to reading on paper such as the tactile feel of holding the book in their hands, tinkering with the pages, feeling the paper on their fingertips.[15] The lack of the paratextual information (cover, color, footnotes, indication of pages) makes the digital text more fluid and less stable than the paper text. This should be detrimental for the purpose of learning and memorizing in particular that typically demand a precise localization and storage of information. A related explanation are the differences in metacognitive performances, i.e. the subjective knowledge level evaluation during the learning process. Digital texts imply a form of shallow reading while reading on paper seems more associated with deep reading. In the study carried out by Ackerman & Goldsmith (2011), it was found that there was a lower test performance on screen compared to on paper.

However, this difference was only observed when study time was fully regulated (unlimited study time) by the participants, as paper readers generally perform better and choose to spend more time with the text. Performance level was similar when study time was fixed and not controlled by the participants. Under both conditions subjective knowledge assessment was overestimated on screen and more accurate on paper. These findings suggest that media does not affect learning itself but rather the effectiveness of learning management. More and more research is showing how stressful digital environments are

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[13] J. Gerlach and P. Buxmann, "Investigating the acceptance of electronic books: The impact of haptic dissonance on innovation adoption", *European Conference on Information Systems (ECIS)*, (2011).

[14] A. Mangen and D. Kuiken, "Lost in an iPad: Narrative engagement on paper and tablet", *Scientific Study of Literature* 4, no. 2 (2014), pp. 15–177.

[15] A. Mangen and D. Kuiken, "Lost in an iPad – Narrative engagement on paper and tablet", *Scientific Study of Literature* 4, no. 2 (2014), pp. 150–177.

and how this impacts negatively on the last generation. Thus, reading on paper seems to also be a way to cognitive overload as a consequence of our digital environments.[16]

A further aspect to be considered is the social significance carried by the old-fashioned reading support. Books are cultural artifacts, sometimes treasured ones. You might find them housed in museums and special collections—like the Book of Kells in the Old Library at Trinity College, Dublin. They can be embedded within national histories—like in Germany, where the legendary Frankfurt Book Fair has a tradition spanning more than 500 years. The first book fair was held in 1454, soon after Johannes Gutenberg had developed printing in movable type in Mainz.

Nowadays, the importance of the physicality of books is emphasized by the new trend of the book photography. Books represent pieces of art that people have in their house and that they show using social communities such as Instagram: #bookphotography, #booklover or #bookstagram[17] are just a few examples where users shoot and post their current reading situation or pictures of their favorite books. As the more than 20 million posts show, the paper book continues to be desirable because it carries with it a material presence and a social prestige that books still have in our world. It's very difficult to explain the resistance of the paper in our digitized world. The social prestige might offer a clue to the reasons why texts on screen are taken less seriously than texts on paper.[18] Indeed, there are studies

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16 See M. Salgaro and A. van der Weel, "How reading fiction can help you improve yourself and your relationship to others", *The Conversation,* 18 December 2017, <http://theconversation.com/how-reading-fiction-can-help-you-improve-yourself-and-your-relationship-to-others-88830>, (8 August 2018).
17 See Instagram, "#bookstagram", <https://www.instagram.com/explore/tags/bookstagram/>, (20 August 2018).
18 M. Salgaro, P. Sorrentino, G. Lauer, J. Lüdtke and A. M. Jacobs, "How to measure the social prestige of a Nobel Prize in Literature? Development of a scale assessing the literary value of a text", *TXT* 5 (2018), pp. 138–148.

showing that readers are less inclined to take screens seriously as a reading surface.[19] These data are worrying since e-books and tablets are largely integrated in didactic activities, i.e. mobile-assisted learning.

1.2 Capitalize on the benefits of digital reading for learning

Digital tools for didactic purposes are a huge trend nowadays, used every day not just outside schools or universities but also inside the classroom. Their popularity encompasses everything from social media to websites, for example, *Facebook*, *YouTube*, and *Google Apps for Education*, and no doubt there are a lot more to come in the future. Digital reading has a very strong potential in terms of language learning, most notably of learning of a foreign language. The growing popularity of Mobile-assisted Language Learning (MALL) is evidence of that. A review of mobile learning projects funded by the European Union since 2001[20] confirms that mobile phones are the most frequently used device in these projects, followed by personal digital assistants (PDAs).

Incorporating new technologies in the language learning process has many advantages, it allows learners to foster communication, creativity, collaboration and critical thinking. Thanks to ICT, learners can easily make use of authentic resources that promote inter-cultural understanding and interact with virtual peers in real contexts. For these reasons, students can be motivated to learn in the way in which they are most interested in and have fun in their learning activity. Recently several apps for learning foreign languages on the smartphone, i.e. *Duolingo,*

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[19] L.M. Singer and P.A. Alexander, "Reading across mediums: Effects of reading digital and print texts on comprehension and calibration", *The journal of experimental education* 85, no. 1 (2017), pp. 155–172; P. Delgado et al., "Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension", *Educational Research Review* 25 (2018), pp. 23–38.

[20] A. Pecherzewska and S. Knot, "Review of existing EU projects dedicated to dyslexia, gaming in education and m-learning", *WR08 Report to CallDysc project* (2007).

Babbel, Memrise, Busuu became more and more popular.

Digital reading is a valid support of reading comprehension of literature, too. It is well-known that reading in a foreign language is one of the best ways to improve the knowledge of it, expand the vocabulary and observe the grammar in the context. But it can become a really frustrating activity, when the reader does not know key words and has to open and close a dictionary every few lines and to keep falling out of the narrative. The dictionary on e-readers is one of the functions that makes the reading experience in a foreign language more flexible and pleasant, since it permits looking at the meaning of a word by simply pressing on it and the definition from the dictionary pops up. Furthermore, e-readers such as Kindle[21] (6th Generation and newer) offer the Vocabulary Builder feature. With Vocabulary Builder, the reader can, besides looking up words with the dictionary, memorize their definitions and create flashcards to learn them. For both parents and educators, knowing whether technologies are improving or compromising education is a question of concern. With the diffusion of e-books, online learning and open educational resources (OER), researchers have been trying to find out whether students do as well when reading a given text on a digital screen as on paper. Within this literature, differences across mediums have been found in terms of speed of processing, text recall, and reading comprehension.[22]

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[21] We focus on one distributor of e-books, Amazon, because it is the main player in the e-books market with shares reaching close to 70% in the US, 60% in the UK and around 40% in Germany and Spain (Wischenbart 2014; Li 2014).

[22] M.A. Kerr and S.E. Symons, "Computerized presentation of text: Effects on children's reading of informational material", *Reading and Writing* 19, no. 1 (2006), pp. 1–19; A. Mangen, B.R. Walgermo and K. Brønnick, "Reading linear texts on paper versus computer screen: Effects on reading comprehension", *International Journal of Educational Research* 58 (2013), pp. 61–68.

2 The role of (e-)dictionaries in the vocabulary acquisition process

Vocabulary learning is an essential part in the foreign or second language learning process.[23] (Summers, 1988). One of the main strategies of vocabulary learning consists of dictionary use. "When students travel, they don't carry grammar books, they carry dictionaries."[24] As crucial self-learning instruments, dictionaries have many different types considering their language basis and design. Regarding their language basis, there are monolingual dictionaries which offer the definitions in the target language and bilingual dictionaries which present definitions in native-to-target or target-to-native languages. Taking their designs into account, there are print dictionaries in hard copy forms and electronic dictionaries which can be divided into two types; online dictionaries and off-line dictionaries. Knight (1994) investigated the practice of using dictionaries while reading. Her results showed that "subjects who used the dictionary not only learned more words but also achieved higher reading comprehension scores than those who guessed from context. In addition, correlations between actual number of words looked up and recall scores reinforce the finding that comprehension does not suffer as a result of dictionary use."[25] There are divergent opinions regarding dictionary consultation while reading in a foreign language. Educators following the grammar-translation methods have supported the extensive use of dictionaries in order to decode text. However, current communicative approach in the didactic of a foreign language focus on strategic

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[23] D. Summers, "The role of dictionaries in language learning", in *Vocabulary and language teaching*, eds. R. Carter and M. McCarthy (London: Longman, 1988), pp. 111–125.

[24] M. Lewis, *The Lexical Approach: The state of ELT and a way forward* (Hove: Language Teaching Publications, 1993), p. iii.

[25] S. Knight, "Dictionary use while reading: The effects on comprehension and vocabulary acquisition for students of different verbal abilities", *The Modern Language Journal* 78 (1994), pp. 285–298.

reading and inferring the meaning of unknown words from context. Those who are sceptical regarding dictionary consultation believe that its excessive use might disrupt the comprehension process and hinder short-term memory involved in vocabulary learning. They encourage print exposure, since they believe that it is more effective and helpful for learning words inferring from context.[26] Numerous studies focusing on post-reading vocabulary and comprehension scores of students with or without the use of dictionaries[27] have reported divergent results, but most are more inclined to show that dictionary use can enable better comprehension depending on learners' proficiency level and other factors too.

From the publishing perspective, in the last years the sale of numerous print dictionaries such as Oxford English Dictionary have fallen due to the increasing popularity of the digitalized version and many publishers made the decision to stop the press and go 100% digital.[28] In his update on the world's lexicographical services, Lan (2005) stated that online dictionaries are the main support of word reference for many people. The emergence of the internet and Google made the original concept of a paper dictionary as a book and a language-learning aid close to becoming obsolete. The advent of electronic dictionaries has raised the inevitable question of whether electronic dictionaries have a similar effect to that of paper dictionaries. Consulting

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[26] W. Grabe and F. Stoller, "Reading for academic purposes: Guidelines for the ESL/EFL Teacher", in *Teaching English as a second or foreign language*, ed. M. Celce-Murcia (New York: Heinle & Heinle 2001), pp. 187–204.

[27] P. Bogaards, "Using dictionaries: Which words are looked up by foreign language learners?", in *Studies of dictionary use by language learners and translators*, eds. B.T.S. Atkins and K. Varantola (Tübingen: Niemeyer 1998), pp. 151–157; S. Knight, "Dictionary use while reading"; S. Luppescu and R.R. Day, "Reading, Dictionaries, and Vocabulary Learning", *Language Learning* 43, no. 2 (June 1993), pp. 263–279.

[28] See A. Jamieson, "Oxford English Dictionary 'will not be printed again'", *The Telegraph,* 29 August 2010, <https://www.telegraph.co.uk/culture/books/booknews/7970391/Oxford-English-Dictionary-will-not-be-printed-again.html>, (29 August 2018).

print dictionaries is considered by many to have the disadvantage of being too time-consuming, while the digitalized ones are faster, easier and more practical to use. Dictionaries of all types are available online (with type-in or pop-up function), as apps for smartphones and for tablet computers or in electronic pocket format. In the last years a large body of studies were devoted to compare and to investigate the usefulness of paper and electronic dictionaries. These studies investigated mainly, i) time for word retrieval, ii) the number of target words retained, iii) the accuracy of selecting L1 equivalent, and iv) learners' impressions of the dictionaries.[29]

2.1 Studies reporting advantages in the use of electronic dictionary

The proponents of electronic dictionary use believe that 1) it is more useful with receptive and productive tasks and 2) it is a better learning tool since its use can reinforce word retention because the ease and speed of use does not interrupt the reading flow and reduces cognitive load and as a result, affords greater comprehension.

Dziemianko (2010) compared the usefulness of a monolingual English learners' dictionary in electronic (online) and paper form in receptive and productive tasks. The results show

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[29] H. Nesi and R. Haill, "A study of dictionary use by international students at a British university", *International Journal of Lexicography* 15, no. 4 (2002), pp. 277–305; G.M. de Schryver, "Lexicographers' Dreams in the Electronic-Dictionary Age", *International Journal of Lexicography* 16, no. 2 (June 2003), pp. 143–199; J. Stirling, "The portable electronic dictionary: Faithful friend or faceless foe?", *Modern English Teacher* 14, no. 3 (2005), pp. 64–71; C. Kobayashi, "The use of pocket electronic and printed dictionaries: A mixed-method study", in *JALT 2007 Conference Proceedings*, eds. K. Bradford-Watts, T. Muller and M. Swanson (Tokyo: JALT, 2008), pp. 769–783; Y. Chen, "Dictionary use and EFL learning: A contrastive study of pocket electronic dictionaries and paper dictionaries", *International Journal of Lexicography* 23, no. 3 (2010), pp. 275–306; X. Xu, "Study on the effect of dictionary use on second language incidental vocabulary acquisition: An empirical study of college English vocabulary learning strategy", *Journal of Language Teaching and Research* 1, no. 4 (2010), pp. 519–523; A. Dziemianko, "Paper or electronic? The role of dictionary form in language reception, production and the retention of meaning and collocations", *International Journal of Lexicography* 23, no. 3 (2010), pp. 257–273.

that the subjects consulting the electronic dictionary performed both tasks much better than those using the paper dictionary. Likewise, the results of the retention test (after one week) indicated that the consultation of the electronic dictionary was more beneficial to remembering both the meaning of the target words and prepositions.

Similar results were presented by Laufer (2000), who investigated incidental vocabulary acquisition in two reading conditions: when unknown words were encountered in a paper text and glossed in the margin, and when they were read on computer screen and explained in a computer dictionary. The group using the electronic dictionary performed significantly better than the "paper group" in the comprehension task of low frequency words (immediately after the reading session) and in long term retention (after two weeks).

The study of Zhiliang (2008) reinforces the belief that a more extensive dictionary search could increase incidental vocabulary acquisition. The research focused on three learning strategies: 1) guessing from context, 2) using e-dictionary, 3) combined guessing and e-dictionary method on EFL[30] students. The results showed that the students using the combined guessing and e-dictionary method significantly outperformed students in the other two groups. One of the reasons explaining these findings might be that the mental effort of working out the correct meaning of a word in a given context and of looking up the definitions of it might promote better memorization. Furthermore, the author argues that the visual impact created by the pop-up window of a word's entry might play an important role too, since it guides student's attention on the unfamiliar word, which created a memory trace of the word and might contribute to its acquisition. This aspect refers to Schmidt's "noticing hypothe-

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[30] English as a foreign language.

sis", a hypothesis suggesting that input does not become intake for language learning unless it is noticed, that is, consciously registered.[31]

In the same line, the experiment carried out by Liu and Lin (2011) on the effects of three types of dictionaries (pop-up online dictionaries, type-in online dictionaries, and printed dictionaries) showed that the group using the pop-up dictionary performed better than the other two in terms of vocabulary learning efficiency, but not of comprehension. This study differed from others because authors controlled for the information provided by various dictionaries[32] and focused on exploring the nature of its associated processes (e.g., vocabulary and text reading) in relationship to participants' subsequent performance. Subjects did not receive the target items to search, but they were free to check any words they wished. After reading a vocabulary matching test a comprehension task was submitted.[33] The better vocabulary performance registered in the pop-up dictionary condition might be related to the fact that students using the pop-up dictionary consulted it twice as many times as students using the other two types of aids. According to the authors, the difference in the consultation frequency can be explained to the fact that students had to exert more effort when using the book dictionary in comparison to the pop-up support, as shown by the average vocabulary searching time (longer in the paper condition).

The beneficial effect of using an e-dictionary was evidenced in long-term study too, conducted by Alharbi (2016) over a full

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[31] R. Schmidt, "The role of consciousness in second language learning", *Applied Linguistics* 11, no. 1 (1990), pp. 129–158.
[32] In order to keep the contents of the three dictionaries the same across conditions, researchers created a specific printed version of a book dictionary for this study. Words that did not appear in the text were omitted in all dictionaries to reduce the possible distractions from irrelevant words.
[33] In the vocabulary task, students were asked to match the 15 pre-selected items to their definition, while for the comprehension test they received 10 multiple-choice questions.

semester in the Saudi Arabian context. Four groups of 35 students were created: 1) using a pop-up dictionary; 2) using a type-in dictionary; 3) using a book dictionary; and 4) with no dictionary (control group). The findings showed that the pop-up and type-in group had significantly higher scores than the book dictionary group on both the comprehension test and the vocabulary test. The qualitative data reported that student's most favored type of dictionary was the pop-up dictionary. According to the author it is reasonable to think that pop-up dictionary use helped to reduce cognitive load, therefore subjects had more time to concentrate on text reading and comprehension.

Guillot and Kenning (1993) underline the motivational function of electronic dictionaries. According to the researchers, electronic dictionaries encourage students to look up more unknown words and "enabled students to leave no stone unturned, and gave them a degree of control over the materials, and momentum," and that leads to the reason why the electronic dictionary can "generate its own learning impetus."[34]

2.2 Studies reporting advantages in the use of paper dictionary

The speed of electronic vocabulary consultation represents valid support when a learner needs to produce a word mid-conversation or hears something that completely hinders their comprehension, but according to some researchers that aspect might lead to a great distraction and compromise in the vocabulary learning process.[35] On the other hand, when students search for a word in a paper dictionary, they have to engage with it: for example, they have to 1) look at the word carefully to try to remember spelling, 2) search for it in the dictionary alpha-

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[34] M.N. Guillot and M.M. Kenning, "Electronic monolingual dictionaries as language learning aids: A case study", *Computers in Education* 23 (1994), pp. 63–73.
[35] J. Stirling, "The portable electronic dictionary: Faithful friend or faceless foe?", *Modern English Teacher* 14, no. 3 (2005), pp. 64–71.

betically (probably returning to the text to check spelling), 3) eye-scan the dictionary page and reject other words, 4) see translation or definition. All those passages imply a deeper processing which helps the fixation of the lexical item into the learner's brain. As Schmitt and McCarthy write "the more cognitive energy a person expends when manipulating and thinking about a word, the more likely it is that they will be able to recall and use it later […] learning strategies which involve deeper engagement with words should lead to higher retention than "shallower" activities."[36] According to the "the depth of processing" hypothesis[37] an elaborate process for acquiring new lexical information leads to higher retention. Consequently, the words searched in a longer process through a hard copy dictionary could be retained better than those looked up in an electronic dictionary. This hypothesis was explored empirically by Koyama and Takeuchi (2004) in a study[38] in a Japanese University that found no significant difference regarding the number of words searched and the search time, but that the words searched with a printed dictionary resulted in better retention (after one week) than those with an electronic one.

The study comparing the effects of using printed dictionaries, pocket electronic dictionaries, and online type-in dictionaries on vocabulary retention carried out by Li-Ling& Liu (2013) in a Taiwanese junior high school bring further data in favor of the printed dictionary. The study adopted a mixed-methods

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[36] N. Schmitt and M. McCarthy, *Vocabulary: Description, Acquisition and Pedagogy* (Cambridge University Press, 1997), p.3.
[37] B. Laufer and J.H. Hulstijn, "Incidental vocabulary acquisition in a second language: the construct of Task-Induced Involvement", *Applied Linguistics* 22, no. 1 (March 2001), pp. 1–26.
[38] Researchers compared English learners reading in paper and electronic dictionary conditions. The experiment consisted of two parts. In the first part, participants (18) had to read two-texts selected from an English-reading textbook without a dictionary and answer the vocabulary test with a dictionary (pocket electronic or paper). In the second part (seven days after) subjects had to answer to recall and recognition tasks. They had to 1) write the translation of 4 target words from the texts and 2) quote the correct usage examples in English from the dictionary of 4 other words.

research methodology with within-subject design. All participants (33) were measured under the three types of dictionaries. The task consisted in reading three adapted articles (of 300 words) in English with a different lexical support and looking up 15 target marked words. Results reported no significant differences among the three types of dictionaries. This indicates that all three types of dictionaries were equally helpful with regard to keeping the target items in the learners' short-term memories. In the two delayed vocabulary tests (two and four weeks after the reading session) results evidenced that that use of a printed dictionary was the most effective in helping the participants to retain the target words in their long-term memories, while the pocket electronic dictionaries and online type-in had similar effects. This finding, however, contrasts with that of Liu and Lin (2011), who suggested that the effort involved with looking up vocabulary would hinder vocabulary learning.

Conclusion

Vocabulary acquisition occupies a key position in learning a second language. How vocabulary is acquired and what the most effective means are to promote effective acquisition are worthwhile lines of investigation in the field of Second Language Acquisition. According to the studies reported above, the use of paper dictionaries seems to enhance long-term retention of new words. However, it is difficult to generalize these results since studies of the use of dictionaries are relatively few and their methodologies, type of dictionary adopted, subjects 'native language, and the same outcomes are different. More importantly, the implicit concepts of what is understood as learning differs widely. Dictionary use as strategy of vocabulary learning deserves more attention in second language vocabulary research and pedagogy, simply because foreign language acquisition is one of the key competences also in a digital society.

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