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Online or Paper Dictionaries in EFL Vocabulary Learning?

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Abstract

Current National Assessment tests have revealed a worrying decline in writing and reading skills in Swedish upper secondary schools. In light of recent advancement in online tools like the online dictionary (OD) and the growing interest in its use for productive and receptive tasks, the aim of this paper is to investigate if ODs induce different results regarding English as a foreign language (EFL) vocabulary learning as opposed to paper dictionaries (PD). This paper finds a growing body of literature exploring this area, however, little research has been replicated or conducted under comparable conditions. Therefore, this paper reviews literature from the past decade on PDs' and ODs' impact on vocabulary learning among intermediate learners, with special reference to vocabulary retention. Key findings of these studies are highlighted and discussed, revealing the outweighing benefits of using the OD in terms of vocabulary retention, particularly with lower-intermediate learners. Finally, issues and suggestions important for future research are outlined and discussed.

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1 Introduction

In Swedish upper secondary and compulsory schools (9th grade), National Assessment Tests (NAT) in English have revealed that while the majority of the students have good speaking and listening skills, their performances in reading and writing tasks are not as satisfactory (Börjesson & Schönberg, 2012; Öhman, 2013; Youcefi, 2012). In recent years, the low proficiency levels regarding reading and writing skills have become a central concern and several suggestions have been made as to how teachers can approach this issue (See Börjesson & Schönberg, 2012). One of many required subskills in reading and writing comprehension is having a well-developed vocabulary knowledge (Grabe, 2009). While vocabulary knowledge constitutes a significant part of the spoken language as well, the spoken language input is, however, assisted by other comprehension clues, e.g. body language, gestures, intonation patterns et cetera (Hedge, 2000). This is why a vocabulary developed vocabulary knowledge becomes particularly important for writing and reading skills. Here, research findings show that successful reading comprehension highly correlates with vocabulary knowledge where dictionary use constitutes one vocabulary learning strategy (Grabe, 2009; Chen, 2011). However, there is a vigorous amount of paper dictionaries (henceforth PD) and online dictionaries (henceforth OD) to choose from, especially as a result of the rapid increase in available online dictionaries. In light of this development, current research is not unified when it comes to the question of which of the two dictionary forms is the most effective one for vocabulary retention.

This literature review discusses and evaluates current research regarding a few specifically chosen PDs' and ODs' impact on vocabulary retention amongst English as a foreign language (EFL) students in upper secondary school (age 16 to 19) with special reference to vocabulary retention in writing and reading skills. Although some studies included in this review paper sometimes use the term English as a second language (ESL) or second language (L2) as an equivalent for EFL, I hereafter solely use the term EFL for addressing students learning English in a foreign language context. The aim of the present paper is to provide an overview of the current state of knowledge in the abovementioned research area over the past decade.

I begin by presenting important theoretical views concerning vocabulary learning in a foreign language in general. Next, I go on to presenting different dictionaries relevant for this literature review and describing dictionary use as a vocabulary learning strategy before moving on to identifying, comparing and evaluating current research studies made in this

field. Methodological differences and comparability issues of relevance, for example, different ways of creating vocabulary tests and scoring them, are then discussed. The various ways of scoring vocabulary knowledge implicitly reveal how vocabulary knowledge is defined in the different empirical studies, an area that certainly needs unified conceptions. This section is then followed by a summative conclusion outlining directions that merit further research.

1.1 Vocabulary learning and testing in a foreign language: theoretical views

The language classroom entails several learning goals, both general and specific, with vocabulary learning being an important one of them, which represents one part of the language item acquisition (Nation, 2001). The relevance and importance of vocabulary knowledge are manifested in its relation to receptive and productive language; in other words, vocabulary knowledge plays a central role in both reading and writing skills. Here, research in readability emphasizes the need for an extensive vocabulary knowledge in reading (Hayati & Pour-Mohammadi, 2005; Krashen, 1989; Nation, 2011). Likewise, vocabulary knowledge is also connected to writing proficiency; the vocabulary size is a determining factor for adequate and satisfying writing skills, especially among EFL learners (Laufer & Nation, 1995). Besides, in contrast to learning vocabulary in English as a first language, vocabulary learning in EFL suggests certain ways of approaching vocabulary development (e.g. Nation, 1990; Nation, 2011) and certain word groups that need to be dealt with rather than others. The vocabulary size of an EFL learner differs in many ways from that of a native speaker; frequency-based studies convincingly show that some words are simply not as useful as others in order to use the language at a proper EFL level (Nation, 2001). However, the EFL learners still need to learn a vast number of words to be able to operate in the language properly. For instance, Nation (as cited in Schmitt, 2008) calculated that regarding how much vocabulary is needed in reading, a quantity of approximately 8000-9000 word families are necessary for comprehending a wide variety of texts; this includes everything from low-frequency words to content and technical words.

Moreover, when having sorted out what words are relevant for the learners, there is also a matter of 'learning burden' which indicates what amount of effort is required to learn a particular word. This effort is highly individual and depends on a number of factors, for example: the learner's background knowledge from other languages, current vocabulary size,

and the regularity of the L2's writing or pronunciation system. For instance, a study conducted by Ellis and Beaton (as cited in Nation, 2001) showed that the higher degree of pronounceability a word has, the lighter the learning burden becomes. Also, the learning burden can depend on the word's 'intrinsic difficulty', i.e. the lexical features of the particular word. In other words, one word can have different degrees of learning burden depending on who is experiencing the actual learning process and what kind of word is to be learned (Nation, 2001).

In addition, one needs to consider and reflect upon what knowing a word actually implies, particularly when reviewing the numerous amount of studies that has been conducted in this field of research and how their ways of scoring vocabulary knowledge may differ from each other. In broad terms, knowing a word, as Ellis presents it (as cited in Nation, 2001), involves three main aspects namely the form, meaning, and use of the word, each one demanding different kinds of learning. Within these aspects lie several subordinate components (cf. Nation, 2001, p. 27).

While some argue that all the subcomponents of knowing a word do not weigh as heavily as others, this literature review does not put the components in a specific order of importance. For instance, spelling and grammatical functions of a word could be regarded as two components being less important in the communicative classroom if balancing them against the meaning and use of the word. Depending on what teaching approach one has (which may vary in different educational systems, teaching traditions et cetera) the aspects of knowing a word can consequently be viewed upon differently.

Since the key concept of this literature review is 'vocabulary retention', special attention is hereafter paid to this term when evaluating ODs' and PDs' impact on vocabulary learning. As vocabulary retention can be measured in different ways, the need for a clear definition is necessary. When studying vocabulary retention, most of incidental learning research has measured the subject's ability to recall the meaning of the learning object. What incidental vocabulary learning refers to is the mode in which the participants of a study are unaware of them being tested on their retention afterward (Chen, 2011). Also, the long-term retention is often measured and determined two weeks after the test proper, preferably followed by another delayed test in order to eliminate affecting factors caused by the experimental environment. In other words, "delayed recall after 2 weeks under experimental conditions is normally referred to as 'long-term retention'" (Yongqi Gu, 2003, p. 13), yet this amount of time is not enough to determine any developed use of the retained words in the long run (ibid.).

In one way, this paper adheres to the definition above concerning the ability to recall word meaning, however, vocabulary retention in this review also puts emphasis on the acquisition of the form and use of the target item. Also, form and meaning should not be treated as separate parts; instead the connection between them is what makes the learner more receptive to retaining the target item (Nation, 2001). This is an aspect that may be important to consider when reviewing test scores and formats regarding vocabulary retention as these can differ vastly. Some tests might measure either meaning or form, and some might focus on grammar and collocations or maybe even a combination of all the previously mentioned aspects of vocabulary knowledge (Laufer, Elder, Hill, & Congdon, 2004). Some test types, like translation tests, can have a higher level of difficulty than others, like multiple-choice tests or matching items-tests (Nation, 2013). Multiple-choice tests, which are also considered the easiest to administer and correct, are sometimes also referred to as sensitive tests since they give credit for partial knowledge as opposed to translation tests. Additionally, multiple-choice provide answers, hence making it doubtful to determine whether the learner actually knows the word or not. If the test maker chooses to provide similar answers to a question, one can steer the degree of accuracy that is required in the answer, thus receiving more imprecise than precise reflections of the learner's vocabulary knowledge. This is an important aspect to keep in mind since the level of difficulty of the test format can have a great impact on what words the learners get right, thus influencing the measurement of their vocabulary size or knowledge as well as how these are reflected in the results (*ibid.*). Also what words one chooses to test is influential on the vocabulary measurement results; some might test high-frequency words (which are more likely to be known by the learners), others low-frequency words (which can, if overused, be difficult to retain at all) (*ibid.*). Additionally, it is necessary to mention the productive and receptive scale of vocabulary retention; this literature review includes both sides of the scale since it is written in light of the concern regarding intermediate Swedish EFL learners' lacking writing and reading skills. One way of increasing the retention of new vocabulary among these learners is by using dictionaries. Since the options are ample, the next section of this paper will outline a few particularly suitable dictionaries for the abovementioned aim.

1.2 Online and paper dictionaries

Following the constant development of Internet and its accessibility in most countries, teaching tools have found their way into this new forum in different forms. In recent years,

numerous PDs have been transformed into online forms, exploring the possibility of enhanced features. In fact, the first limitation of this paper has to do with this constant development of online dictionaries. Several of the studies reviewed in this paper have surveyed a limited number of ODs' effects on vocabulary retention. As soon as these studies have been published, the ODs have already become more technologically advanced, thus in some cases making research findings less useful. This is also one of the many differences between ODs and PDs, where the latter dictionary form cannot be updated in that same short time frame.

Given the character of this paper, one has to consider what dictionaries have been examined more than others for it to contribute to the educational discourse community. Besides, the proficiency level of intermediate learners has been taken into consideration when choosing different studies treating certain dictionaries. Thus, the (monolingual) dictionaries, ODs and PDs, discussed in this paper are: (1) *Collins COBUILD Advanced Dictionary* (2008), (2) *Longman Dictionary of Contemporary English* (2009), and (3) *Oxford's Advanced Learner's Dictionary of Current English* (2005). Because of lacking studies on American English dictionaries, e.g. *Merriam-Webster's Advanced Learner's English Dictionary* (2008), this paper focuses on British English dictionaries.

Furthermore, some empirical studies survey the effects of bilingual ODs and PDs on vocabulary retention, and these are also synthesized and evaluated in this paper. The aspect of whether to choose monolingual or bilingual dictionaries with intermediate EFL learners is particularly interesting since numerous learner variables, such as proficiency levels and learner preferences, are connected to how successful dictionary use may be on vocabulary retention (Tono, 2001). Thus, this paper involves empirical studies conducted by using both monolingual and bilingual ODs and PDs, thus enabling a broader perspective on the area.

1.3 Dictionary use: a vocabulary learning strategy

There are several useful vocabulary learning strategies that can be successfully used by EFL learners; dictionary use is acknowledged as one of them (Nation, 1990). As mentioned earlier, choosing your dictionaries should highly depend on what they are to be used for and by whom. Also, there is the issue of different proficiency levels among intermediate learners, stretching from low-proficiency to high-proficiency students. For a dictionary to be helpful in vocabulary retention, it must highlight the relationship between form and meaning, something that is easier retrieved from monolingual dictionaries than bilingual ones, where the latter gives the learner a translation instead of a definition of the target item (ibid.).

Chen (2011) reviews different research mainly showing that there appears to be a positive impact on vocabulary retention when using dictionaries, however, “the more proficient readers tended to learn more words than the less proficient ones” (Chen, 2011, p. 219). On the other hand, a study by Laufer (as cited in Chen 2011) showed no significant contribution to vocabulary retention when using dictionaries; however, these results could be explained by the learners’ lacking dictionary skills. It is worth mentioning that inadequate lexical knowledge along with lacking dictionary skills account for the absence of any positive effects dictionary use might bring upon vocabulary learning (See Nation, 2001, p. 285ff). Fraser (1999) claims that, if given proper training in dictionary use, learners can double their vocabulary retention when consulting a dictionary (as cited in Nation 2001). However, it has been pointed out that the separate use of dictionaries will not affect vocabulary learning and acquisition in a remarkable way, since learning vocabulary is a cumulative process (Knight, 1994: Nation, 2001). This type of knowledge should be added to in several differing encounters (Nation, 2001). On the other hand, dictionary use is not a strategy that should be disregarded; on the contrary, it is a great asset for vocabulary learning if used properly. For instance, one study by Nagy, Herman, and Anderson (as cited in Krashen, 1989) showed that the chance of acquiring a word from one exposure lay between five to twenty percent, depending on the testing method. Although this percent is not remarkably high, it is still important to point out considering how much reading EFL learners are involved in and how this might reflect on their vocabulary retention when increasing dictionary use.

On another important note, the choice of dictionary type (monolingual or bilingual) is important to consider. Because of the intermediate learners’ varying proficiency levels (from lower to higher), their needs and attitudes towards dictionary types may differ from learner to learner. However, in a majority of studies (See Tono, 2001, 43f) beginning and intermediate EFL learners preferred using bilingual dictionaries over monolingual ones. For students with lower levels of language proficiency, it might be better to avoid monolingual dictionaries since they might have difficulties understanding the provided definitions, which in turn affects their comprehension negatively (Hayati & Pour-Mohammadi, 2005; Laufer & Kimmel, 1997). In another study, conducted by Li (2009), beginning and early intermediate learners in a Chinese EFL context encountered various problems when using monolingual PDs; these problems mostly considered complicated sentence structures of the definitions and a large number of unknown words in the definition entries. Findings like these evidently promote the fact that learners’ previous vocabulary knowledge and vocabulary size are crucial for determining whether dictionary use is beneficial for vocabulary retention or not, especially

depending on their type and form. In the same study, using ODs providing both monolingual and bilingual definitions was found to be the dominant strategy used among the same learners. This can be seen as a natural effect of the ODs' many benefits and advantages, one being their accessibility for the learners and another being their not so time-consuming activities in comparison to PDs.

In summary, Albus, Bielinski, Thurlow, and Liu (2001) revealed that most studies point toward the advantages of dictionary use in vocabulary learning, especially among intermediate-level students. In fact, Albus et al. (2001) reported that dictionary use brought about a significant effect only for intermediate-level students as opposed to lower and higher level proficiency students. However, several affecting factors, some presented above, need to be considered when deciding the right dictionary for the specific learner group. What is interesting for this review is whether the dictionary form, OD or PD, induces different results regarding its impact on vocabulary retention.

2 The usefulness of ODs and PDs in terms of vocabulary retention

Since the development of ODs, studies regarding their usefulness and benefits in EFL classrooms have increased rapidly, often in comparison to PDs with reference to their form and effect on vocabulary learning and retention.

Both of the dictionary forms offer several beneficial features; however, one of the most mention-worthy differences between them is the easier and faster search speed involved in OD consultation, something that has been examined to a great extent (Dziemianko, 2012a). In a study conducted by Liu and Lin (2011) it was found that the participants appeared to look up more words in ODs, most likely because of their convenient ways to search. These results are supported by Kobayashi (2007) who also found the look-up frequency to be higher when consulting ODs in comparison to PDs. Since a word needs to be encountered several times and in different ways for it to be fully acquired, the OD might be more helpful for vocabulary retention than the PD since the learners are willing to look up a word several times and therefore repeating it (Liu & Lin, 2011).

In their study, Liu and Lin (2011) examined the efficiency of three different dictionary types on vocabulary learning. These considered the pop-up dictionary, type-in dictionary (equivalent to an OD) and a PD. The pop-up dictionary enabled the students to click on a target item in the text and easily retrieve a word definition window. This retrieval process was similar to the one with the type-in dictionary where the participants received an entry window where they typed in the unknown target item to retrieve its definition; in other words, the two searching processes were very much alike. The 80 Taiwanese university EFL learners in this study were all ensured to have the same level of intermediate proficiency through an English proficiency classification exam (*ibid.*). All of the participants were then divided into four groups depending on which dictionary type they were consulting; the fourth group was a control group using no dictionary. The experimental test was divided into two parts, one considering vocabulary learning and the other one reading comprehension. For the vocabulary test, which was not expected by the students, the subjects were tested on 15 (out of the original 24) low-frequency target items. When ensuring that all of the target items were unknown by the involved subjects, the authors had them controlled, first by six additional college students who were requested to mark unknown words (a total of 24 words), then by two university teachers who selected these 15 words based on their relevance to the text.

These procedures were administered in order to verify the content validity of the test (ibid.). For the actual test, the test subjects were given these 15 words and were requested to match them with 16 different definitions (all presented at once), thus leaving one additional wrong choice in order to increase the test's level of difficulty.

The results of the study revealed that the pop-up dictionary seemed to benefit vocabulary learning to a greater extent than the other two dictionary types. As an explanation, the authors suggested that the effort involved with consulting the PD in vocabulary learning probably hampered the vocabulary learning, thus leaving it not as beneficial for vocabulary retention as the pop-up or type-in dictionary. However, the vocabulary performance score of those consulting the type-in dictionary was not far behind (mean deviation of 78.13 compared to 79.06) (See Liu & Lin, 2011). For calculating the vocabulary learning efficiency, the answer accuracy was divided by the time spent searching for the target item, where the pop-up dictionary group clearly outperformed the other groups (with a search speed being double as fast). On another important note, it is also problematic to claim that the consultation of the PD actually hampered the retention of the words learned since no delayed recall tests were administered to empirically support this remark. Also, it is not stated what dictionaries the different online tools were based on, nor what PD the subjects consulted (only that it was an English-Chinese dictionary). In other words, it is not demonstrated from what dictionaries (e.g. *Longman's Dictionary*, *Oxford's Dictionary* et cetera) the definitions are retrieved from (See Appendix).

In contrast to the ODs used in the abovementioned study, most of the ODs presented in this paper (See 1.2) offer multimodal features. The multimodality of the OD (visual, textual, and verbal elements) together with its diversity of information (translation, authentic examples, pictures, games, pronunciation) provide several routes of retrieval when looking up the word and might, therefore, benefit retention. This idea is consistent with what Paivio discusses as *Dual-coding*, namely the fact that information that is coded in several forms is more effective for learning than information coded in one form (as cited in Amirian & Heshmatifar, 2013). One empirical finding strongly supporting the Dual-coding theory was presented in a recent study by Rezaei and Davoudi (2016). In their study, the vocabulary retention of 70 intermediate-level Iranian EFL students was tested after consulting either an OD or a PD. The subjects in the OD group clearly outperformed the PD group on the two weeks delayed vocabulary retention test with a mean difference of 9.39 (See Rezaei & Davoudi, 2016). The participants in the OD group used the mobile dictionary application *Blue Dict Dictionary*, consisting of different dictionaries but mainly the *Longman Dictionary of*

American English and the *Oxford Advanced Learner's Dictionary*. This application provided lexical information in various ways and modes, e.g. audio, visual, and textual, which supports the notion that learning is enhanced when information is presented in more than one single mode.

Although an OD enables and encourages more experimental browsing, because of its less time-consuming features, this may not necessarily induce actual retention of the information. Instead, researchers such as Sharpe and Nesi suggest that this only leads to a shallow processing which is not beneficial for vocabulary retention (as cited in Dziemianko, 2010). From the Cognitive Load Theory perspective (CLT), “learning performance is based on the interaction between the task, learners’ prior knowledge, and learners’ cognitive architecture constraints, namely the [work memory] limitations” (Liu & Lin, 2011, p. 375). From this point of view, it is indicated that the search effort in PDs could be considered as a deeper process than the one occurring when consulting an OD. The fact that the learner spends more time searching a word in a PD than in an OD and has to hold the target item in their working memories for a longer time in the former situation might result in deeper processing (Chiu & Liu, 2013, Koyama & Takeuchi, 2004). Kobayashi supports this point of view in his study, which circumstantiated that frequent consultation with the OD might result in “less interaction with the textual context, particularly for [EFL] students who are not proficient enough in English or skilled enough in [lexical processing strategies] use to take advantage of [electronic dictionaries]” (2007, p. 666). In other words, the OD might not essentially have a positive impact on lower-proficient EFL students’ vocabulary retention. Therefore, it is supposedly also difficult to draw any general conclusions by claiming that the more words the learners look up in ODs, the higher the possibility is of retaining more words. On the other hand, some researchers argue that the search effort involved in PD consultation could enforce a heavier burden on learners and contrarily be disadvantageous for vocabulary retention. In this point of view, the ODs would possibly impose higher vocabulary retention because of the search speed not disturbing the reading flow (Dziemianko, 2010; Laufer & Hill, 2000; Liu & Lin, 2011). In that same vein, it is also emphasized that the amount of vocabulary retained is not dependent on learners’ look-up frequency.

In alignment with the Involvement Load Hypothesis, it is emphasized that what actually matters are the involvement and attention during the look-up process (Laufer & Hill, 2000). In other words, when putting a greater mental effort in attaining information, this can result in higher retention results in contrast to obtaining information with less of an effort (Laufer & Hulstijn, 2001). This, again, relates to vocabulary retention being conditional on

how deep the processing of the word is and the learner's attention during this process (See Dziemianko, 2012a). One study acknowledging this hypothesis is the one conducted by Zou, Xie, Wang, Wong, and Wu (2015) where it was found that the consultation of PDs induced a deeper processing and hence also contributed to more words being retained. Another study by Chiu and Liu (2013) revealed similar results, where the PD was more beneficial for vocabulary retention in comparison to an online type-in dictionary and a pocket electronic dictionary. Although this study included English learners on a beginning level (ages of 13 and 14) with only four years of instruction and little training in dictionary use, it was argued that the deeper processing involved in consulting the PD explained the results. Nevertheless, many studies reviewed in this paper do not entirely confirm these hypotheses, the first one reviewed below.

In a study conducted by Dziemianko (2010), the role of dictionary form in vocabulary retention among 64 upper-intermediate and advanced EFL students was examined. The dictionaries used for this study were the online and paper form of the 6th edition of *Collins COBUILD Advanced Dictionary* (2008) (hereafter COBUILD6). The experimental method consisted of a pretest, test proper, and an unexpected delayed test on vocabulary retention. In the test proper, the participants were expected to complete two tasks. First, to explain nine English nouns and phrases either in English or Polish (their native language), and second, to complete nine sentences with their missing prepositions, thus testing retention of meaning and collocations. The participants were then divided into two groups, one using the online form of COBUILD6 and the other one the paper form for completing the tasks. The participants were also given the opportunity to acquaint themselves with the different dictionary forms before the test proper. In order to eliminate the probability of the participants knowing the target items beforehand, the same test was administered in the pretest but without any dictionaries. This test also included questions regarding their familiarity with the two dictionaries. In the delayed test, which was conducted two weeks after the test proper, the only difference from the test proper related to the order in which the target items were presented. How the subjects' answers were scored or what the requirements for full points were in these tests are left unmentioned in the study.

In the study, Dziemianko (2010) reports that the subjects in the OD group outperformed the PD group in the test proper. Likewise, the findings of the delayed retention test show that the online form of COBUILD6 was more beneficial than its paper form for retaining word meaning and collocations. Interestingly, the arguments for ODs inducing a negative effect on vocabulary retention, due to the risk of shallow processing, are not

supported by the specific findings of this study. Instead, Dziemianko argues that the layout of the OD seemed to attract the subjects' attention, thus the higher vocabulary retention scores. On another important note, the same information was being offered in the two dictionary forms, thus strengthening the claim that the actual dictionary form brought about different retention results and not what lexical information was being offered in the dictionaries. Moreover, the findings of this study challenge the assumption that greater attention, in the meaning of a larger effort, during the look-up process is what matters to vocabulary retention. Instead, the study reasonably argues that the impact of visual features in the OD (in this case, the online form of COBUILD6) attracts more attention than what is being packed in the printed page of the same dictionary and is therefore more meaningful for vocabulary retention than how large of an effort the learner puts into the look-up process. In other words, the particular layout of the paper form of COBUILD6 and the fact that PD pages, in general, are full with listed headwords might serve as an explanation as to why the subjects in the PD group obtained lower scores on the retention test. Another factor worth mentioning is that this study did not examine the subjects' vocabulary size, an aspect of vocabulary that can have an impact on test results like these, especially if the subjects' vocabulary sizes differ significantly from each other.

In a second study, Dziemianko (2011) replicated her previous one by examining the possibility of obtaining the same positive results by only changing one variable, namely the dictionary. The aim of this study was to determine whether the dictionary form in itself enhances vocabulary retention, or if inter-dictionary differences have a significant impact as well. The same tests were used for this study, but the participants consulted the *Longman's Dictionary of Contemporary English* (5th edition, 2009) (hereafter LDOCE5), here also divided into OD and PD groups. The study included 87 upper-intermediate and advanced Polish students of English. If the participants by any means knew a word in the pretest, these were being eliminated from the following analysis, as in the study conducted in 2010; the test format was identical to that of the previous study. Also, no vocabulary size tests were administered, and there was no mention regarding the scoring procedures of this replicated experiment. In the present study, Dziemianko's findings (2011) instead revealed that there were no statistically significant result differences between the OD and PD groups in the test proper nor in the retention test when consulting LDOCE5. Since the retention was 66% better with COBUILD6 than with LDOCE5, the latter is thus not regarded to induce any significant effect on vocabulary retention exclusively because of its dictionary form. Instead, it is argued that the results could be explained by inter-dictionary differences (ibid.). For instance, the

layout of COBUILD6 online appears to be clearer and more organized in comparison to LDOCE5 online, where the latter contains an excess of colorful widgets and disruptive banners. Consequently, these attributes make the dictionary information less prominent, and the learner's attention might, therefore, be misdirected.

In support of the findings above, Dziemianko (2012b) replicated her study a second time but with the 7th edition of the *Oxford Advanced Learner's Dictionary of Current English instead* (2005) (hereafter OALDCE7). The aim of this study was twofold; on the one hand, it examined the usefulness of the online and paper form of OALDCE7, and on the other hand it compared the results to the former ones in her previous studies (Dziemianko, 2010; Dziemianko, 2011). This study involved 86 students of English, and their proficiency level was confirmed to be at the same level as in the previous studies through a grammar test in practical English. In the same vein, the results obtained from this study showed no significant difference in vocabulary retention between the two dictionary forms, as was the case with LDOCE5. By contrast, users of COBUILD6 online remembered 90 and 170 percent more than those who referred to LDOCE5 and OALDCE7 online in previous studies (ibid.). As shown in the study, OALDCE7 online is not as neatly organized as COBUILD6, where the former one provides the learner with the entry of the looked-up word with other entries following it which reminds of the paper version, only on screen. It could be possible that this sequenced presentation of entries interfered with the learners' attention and consequently brought about lower retention results in comparison to COBUILD6. In addition, the entries for a word were much longer in OALDCE7 online compared to COBUILD6 online, another dissimilarity posing as a possible explanation for why the retention scores were much higher in the latter dictionary group. The vast amount of lexical information could have lowered the chances of retention; however, this idea lacks enough verification (Dziemianko, 2012b).

Keeping the above findings in mind, one would possibly start to disregard the usefulness of *Oxford's Advanced Learner's Dictionary*. However, one study by Chen (2011) revealed different results when examining the bilingualized dictionary type, *Oxford Advanced Learner's English-Chinese Dictionary*, one that is highly popular with Chinese EFL learners. The bilingualized dictionary differs from the monolingual and bilingual one in that it offers the learner both a definition and translation of the target word, two combined features which make the utility of the dictionary particularly interesting. The study included 176 participants, however, these were undergraduate English majors in universities. Despite them being university students, they can be compared to upper-intermediate students in upper secondary schools when examining their vocabulary size and vocabulary knowledge (See Chen, 2011).

Also, they have studied English for at least eight years, like upper secondary school students in Sweden. They were divided into three test groups; one group using the paper bilingualized dictionary (PBLD), one using the electronic bilingualized dictionary (EBLD), and the last one using no dictionaries (ND). The EBLD group was also given a few minutes to acquaint themselves with the dictionary. The participants were then also divided into three levels based on their vocabulary proficiency: lower, medium, and higher. The comparisons made in the study only included the higher and lower level group. For the vocabulary retention task the students were first tested in an immediate retention test and then in a seven days delayed retention test (both tests were unexpected); for these tests, ten words (such as collocations, phrasal verbs, and idioms) were tested.

Regarding the test format, the author decided not to draw on everything that the subjects might know about a word, arguing that a learner's vocabulary size often reveals the vocabulary depth, the latter deepening as vocabulary size increases (ibid.). Chen further reports that there does not exist any consensus regarding what aspects of a word are most important to test, implying a need for unified conceptions. Therefore, the author administered Nation's *Vocabulary Levels Test* (See Nation, 2001) in two sections, testing a total of 100 unknown words; first using a match-items test, and second requesting subjects to fill in the target item's word form based on a sentence context. In the latter section, any minor spelling or verb tense errors were disregarded, e.g. **sooth* instead of the correct answer *soothe* or *scared* instead of *scare* (ibid.). The retention tests were scored with one point for correct responses and a half point for partial knowledge. If the subjects gave other correct meanings of the target item instead of the ones used in the reading text, they could still receive points. Furthermore, the target items were chosen, among other things, upon the assessment of three teachers' teaching experiences and upon the target items' word class, in this case not being proper nouns or technical terms.

Although the EBLD group obtained higher scores on vocabulary retention, the study did not show any significant differences between the PBLD and EBLD groups. Interestingly, those who used the PBLD in the higher level group fared better than those using the online form. On the other hand, the ones who used the EBLD in the lower level group scored significantly higher than those who used the PBLD. These findings support Chiu and Liu's suggestion (2013) that less proficient learners might benefit more from ODs than from PDs, for example, because of their fuzzy searches, allowing to search for a word's inflected form, and the ease of retrieving target items. Also, in a similar study conducted by Amirian and Heshmatifar (2013) it was revealed that when using LDOCE5, the OD group (consisting 30

Iranian lower-intermediate EFL learners) outperformed the other 30 learners in the PD group in vocabulary retention, thus being consistent with the findings of the abovementioned studies.

In line with the Involvement Load Theory the search effort involved with PDs might impose too high a burden when learning vocabulary, as was probably the case in Chen's results (2011), something that evidently is determinant for vocabulary retention among lower-intermediate learners. However, many studies above have proven otherwise (Dziemianko, 2010; Liu & Lin, 2011). Also, factors such as the dictionaries' different features and functions along with the subjects' learning styles are a few examples of what can also impose a higher or lower burden upon vocabulary learning and retention. All of these affecting factors only make up a small portion of what explains the mixed findings regarding ODs' and PDs' impact on vocabulary retention. There is also, as contrasted above, the matter of methodological differences which can explain the variety of results in this research area, a discussion which will be raised in the next section. Some comparability issues regarding the studies reviewed above will also be highlighted and discussed in the next part, as a part of the general discussion.

3 Discussion

3.1 Benefits of consulting the OD and PD

As mentioned above, both of the dictionary forms entail several advantages, as well as disadvantages, in vocabulary learning. This becomes interesting when, contrastively, discussing the dictionary forms' usefulness and benefits regarding vocabulary retention in particular. Some of the main advantages of ODs in the public domain (like the ones mentioned in 1.2) are their ever-growing storage capacity, their ongoing updates of content, and the mere fact that they are, in most cases, free of charge (De Schryver, 2003). Also, the retrieval speed of the target item is much higher than in PDs, which reduces the actual search effort, and sometimes the target item is even accompanied with pronunciations (*ibid.*). Additionally, the ODs offer the possibility of fuzzy searches which provide learners with the ability to look up words in their inflected forms, something proven to be highly beneficial for learners on a beginning level (Chiu & Liu, 2013). The study by Amirian and Heshmatifar (2013) also confirmed the OD to be more beneficial for lower-intermediate learners, possibly because of the abovementioned advantage involved in its consultation.

The PDs entail significant advantages of their own as well, such as the ability to make physical comments and notes, the fact that they can be carried around relatively easily, and that their availability is independent of Internet and computers (De Schryver, 2003). Also, the fact that the use of a PD involves a greater searching effort has in some studies shown to be beneficial for vocabulary retention (Chiu & Liu, 2013; Kobayashi, 2007; Koyama & Takeuchi, 2004; Zou et al., 2015). Furthermore, Béjoint (as cited in Dziemianko, 2012a) outlines the fact that the content of a PD is not easily changed whereas almost anyone can produce and change dictionaries online. Consequently, such features can have learners perceive the PD as more reliable (Koyama & Takeuchi, 2004), however, this highly depends on learners' proficiency levels. Also, these beneficial attributes of PDs are countered by the ODs' improved search engines, storage capacities, corpus examples and avoidance of too many abbreviations since the format in itself eliminates the issue of space restrictions (De Schryver, 2003).

On a more specific level, it has become clear that depending on what OD is being used in vocabulary learning, the outcome of vocabulary retention may differ. For instance, Dziemianko (2012b) proved in her replicated studies that different ODs brought about different results depending on which OD was being used: COBUILD6, LDOCE5, or

OALDCE7. Here, the inter-dictionary differences evidently affected the subjects' retention results in various ways. Layout, the organization of headword entries, and the amount of provided lexical information obviously had an impact on how many words were to be retained. Therefore, it might be wise to be careful when choosing what OD to use in vocabulary teaching, and not choose any OD because the dictionary form has proven to be more beneficial than the other. This choice also has to depend on the learner's proficiency level and learning preferences: one group of students might prefer using different ODs simply because of the fact that different layouts attract some learners' attention more than others'.

When it comes to familiarizing oneself with dictionaries, this clearly has to be dedicated a larger amount of time than a couple of minutes, as was the case in Chen's study (2011). As Fraser pointed out (as cited in Nation, 2001), if the learners are given enough time to acquaint themselves with the dictionary, this will naturally increase the number of words retained. Thus, it is crucial to provide learners with enough training in order to be able to draw any conclusions regarding the dictionary's effect on their vocabulary retention. For a learner to be able and make the utmost out of the lexical information provided in a dictionary, adequate skills in using it are obviously required, something that has been difficult to measure accurately in some studies (Chen, 2011; Chiu & Liu, 2013). If only given a few minutes of training and acquaintance, the subjects might not get valuable information about all of the dictionary form's beneficial features and functions, therefore not knowing that they could have taken advantage of them when looking up the target items of the experimental task. In other words, lack of experience in dictionary use may account for the failure of dictionary access to have any positive effects on vocabulary retention. In the case of ODs, it might even be useful to consider using mobile applications like the one utilized in the recent study by Rezaei and Davoudi (2016), which was based on the lexical data of several different dictionaries. In the case of this particular study, it actually proved to be highly beneficial, considering the fact that the OD group outperformed the PD group significantly. On the other hand, however, the vocabulary retention was no longer only dependent on the dictionary form but also on the lexical information provided in the OD in comparison the PD.

Furthermore, even though several studies have suggested that the LDOCE5 and OALDCE7 are not that useful for vocabulary retention, especially in comparison to COBUILD6, it is important to remember that these suggestions were made four years ago. That amount of time is most likely determinant when considering how useful they might be today and how much different they must look thanks to advances in technology. Thus, it is problematic to fully embrace four-year-old results when things have moved on a bit since

2012 and these tools are being updated and enhanced on a daily basis. The dictionary form is obviously a determining factor when examining its usefulness for higher- and lower-intermediate learners. However, as previously highlighted, the dictionaries' different features and attributes might also be more or less beneficial depending on the learner group and their various learning styles, where the latter factor has not been examined enough.

Finally, the aspect of whether to use a monolingual, bilingual, or even a bilingualized dictionary is another important one to keep in mind. It has convincingly been argued that for intermediate learners, particularly the lower-proficient ones, it might be wiser to consult the bilingual dictionary due to the possible lack of dictionary skills or the low proficiency level. After all, using the monolingual dictionary properly requires a reasonable level of proficiency (Hayati & Pour-Mohammadi, 2005; Nation, 2001).

3.2 Comparability issues and methodological differences

The studies reviewed in this paper have differed from each other in several aspects, thus posing some comparability issues between them worth discussing.

First of all, the sample sizes of the studies differ significantly. While most studies' sample sizes ranged between 60 and 80 participants (Amirian & Heshmatifar, 2013; Dziemianko, 2010; Dziemianko, 2011; Dziemianko, 2012b; Liu & Lin, 2011; Rezaei & Davoudi, 2016), one included far more participants. The study conducted by Chen (2011) included the largest number of participants, namely 176. Studies like this one give a broader picture of the examined area and thus more value to it. This study was also one of the few ones that divided the participants into different levels of proficiency, consequently expanding and giving more depth to the results. Dziemianko also varied the levels of proficiency in her studies (2010; 2011; 2012b) by including upper-intermediate and advanced students, which in the upper secondary school context correspond to the higher-intermediate learners. On the whole, however, most of the studies reported the OD to be the most useful dictionary form for intermediate learners (Amirian & Heshmatifar, 2013; Chen, 2011; Dziemianko, 2010, Dziemianko, 2012b; Liu & Lin, 2011; Rezaei & Davoudi, 2016).

Secondly, the studies have evidently used different ways and methods of testing vocabulary knowledge, which implicitly says something about the different authors' take on the concept of what knowing a word really involves. As Chen (2011) pointed out, there is no unity on this issue. For instance, in his study participants received points despite misspellings. It was also possible to receive points if one wrote other meanings of the target items that did

not fit into the reading context. As Ellis highlighted (as cited in Nation, 2001), what lies within knowing a word generally involves knowing the form, meaning, and the use of the word. Not many studies followed this way of measuring vocabulary knowledge. Chen (2001), being one of them, disregarded the fact that the participants got the contextual meaning wrong, which in turn only displays partial knowledge of the words (Nation, 2013). One can thus question whether results obtained by scoring procedures like these really measure vocabulary knowledge. In Chen's (2011) vocabulary size test, for example, participants received points for minor spelling errors and verb tense errors, which implicitly tells us that word form is not as important as word meaning. In all of Dziemianko's studies (2010; 2011; 2012b), no information was provided on how the scoring was administered, thus leaving it difficult to evaluate this aspect of her results.

Thirdly, the test designs themselves have proven to differ vastly from each other. As presented in 1.1, depending on what type of test is administered, the difficulty level can vary greatly. While some studies valued higher difficulty levels by using translation tasks or requiring explanations of the target items in their tests (Dziemianko, 2010; Dziemianko, 2011; Dziemianko, 2012b), others used sensitive tests like match-item tests and multiple-choice tests. For example, Liu and Lin (2011) provided a list of 15 words, requesting the subjects to match them with 16 available definitions. In cases like this one, it is difficult to determine whether the participants' choices were made upon actual knowledge or not, thus making the scoring results a bit doubtful. It is obvious that the participants might as well guess and maybe get the answers right, therefore it does not reveal their actual knowledge. It could be possible that the authors were aware of the multiple-choice tests' low reliability rates, but that they chose these types regardless since the difficulty level instantly becomes lowered and maybe that the results even matched their hypothesis. It is, of course, difficult to conclude this *per se*, however, it is an interesting thought to keep in mind since one can easily regulate what degree of impact the test format and the test types should have on the rate of accuracy among the participants' answers. By using different test types, the results may, in fact, differ hugely (Nation, 2001).

Lastly, it is also important to consider what words one should test in EFL contexts. Dziemianko used few target items (nine nouns) but made sure that they were considered low-frequency words (2010; 2011; 2012b). Liu and Lin (2011) did the same, using 15 low-frequency words. The benefit of including few rather than too many low-frequency words is that they do not become too difficult for the learner to retain. Also, it is interesting to reflect upon whether the choice of using nouns as target items makes the test easier for the subjects.

Of course, this depends on their proficiency level. As was the case in Dziemiako's studies, all of the participants were either upper-intermediate or advanced students, which could make her choice of word class questionable depending on the words' level of abstractness.

4 Conclusion

Undoubtedly, there is a great need for evaluating different dictionaries' level of impact on vocabulary retention, especially since the number of dictionaries online is steadily increasing. This literature review provides an overview and a critical evaluation of the published research over the past decade on the topic of ODs' and PDs' impact on vocabulary retention. The paper reviewed studies that examined three different dictionaries' impact on vocabulary retention among both lower- and higher-intermediate learners. The dictionaries were examined in their online and paper forms, and their inter-dictionary differences were evaluated. For instance, the findings of Dziemianko's replicated studies evidently showed that different features and functions between LDOCE5 and OALDCE7, and COBUILD6 played an important role in vocabulary retention scores. Also, affecting factors like the studies' sample size, test designs, scoring procedures and definitions of vocabulary knowledge have been contrasted and discussed, revealing that unified conceptions are lacking.

In general, most of the studies revealed the advantages of using the OD in terms of vocabulary retention, especially with lower-intermediate learners, therefore countering the idea that the deeper processing involved with consulting the PD would be more beneficial. In light of this present paper, ODs are worth recommending in EFL vocabulary learning. However, several variables, some mentioned above, might have affected the outcome of the research studies which makes it problematic to claim the ODs' definite usefulness and efficiency. This paper has shown that dictionary form is not the only factor affecting long-term vocabulary retention. While vocabulary retention has proven to be dependent on dictionary form to a certain degree, other factors, such as dictionary layout, vocabulary size, and varying proficiency levels have also had an important role in the reviewed literature. Additionally, research on other ODs than the ones discussed here is needed for strengthening the positive suggestions regarding the ODs' usefulness for vocabulary retention.

In view of this, this review suggests that this research area requires a more unified research base along with more extensive and convincing evidence of the ODs' and PDs' impact on vocabulary retention. Although most of the empirical research studies have been fairly thorough in their analyses, there is still a great need for improved research quality standards. There is, as this paper shows, a noticeable lack of agreement upon how to test vocabulary retention accurately and what knowing a word really implies. As raised in this paper, it becomes apparent that the type of task is not indifferent to the learning outcome. Also, for research to actually contribute to its discourse community, it needs to be conducted

more extensively (by involving larger sample sizes) as well as being replicated, the latter something that Dziemianko strongly advocates (2011). Furthermore, for studies to reveal the most about different dictionary forms' benefits for vocabulary learning, they need to be more concentrated, include several aspects of vocabulary knowledge, and make a deliberate decision on how and what to test. Just as importantly, the studies need to be followed up as ODs are being updated continually, offering more advanced functions and features that are yet not examined enough.

In consideration of the abovementioned, a few existing areas could merit further attention and investigation. Firstly, the dictionaries that have been reviewed in this paper are mainly monolingual ones. As vocabulary learning theories in EFL contexts propose, the use of monolingual dictionaries requires satisfactory dictionary and language proficiency skills. For the intermediate learner group, it might be of interest to further investigate bilingual dictionaries in the Swedish context. Also, one suggestion is to further investigate the usefulness of American dictionaries, e.g. *Merriam-Webster's Advanced Learner's English Dictionary* (2008), since American English is becoming more and more popular among upper-secondary school students in Sweden. Secondly, clarifications regarding scoring procedures are highly needed among several studies for them to ensure stronger evidence on the dictionary forms' effects on vocabulary learning.

Additional areas meriting further investigation are the issues of the dictionaries' different features and attributes, and how these might affect vocabulary retention differently depending on learner group on the one hand and learning styles on the other. Here, research is lacking with only a few investigating inter-dictionary differences (e.g. Dziemianko, 2011; Dziemianko, 2012b). Having said that, replicated studies are again necessary in order to shed some light on this perspective of the research field. Otherwise, as is the case with many studies in this paper, the findings of different authors become incomparable because of too many dissimilar variables. For the background of this paper, it is also of high interest to examine this area in the Swedish EFL context, with regards to the nationally declining levels of writing and reading skills and how this issue can best be solved. As this paper initially emphasized, the improvement in reading and writing skills is highly dependent on vocabulary size and knowledge (Nation, 2001). Thus, this paper has hopefully outlined a few guidelines on the right path for examining this vital change in writing and reading skills in terms of using different forms of dictionaries in vocabulary learning.

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Appendix: conditions of the experiment

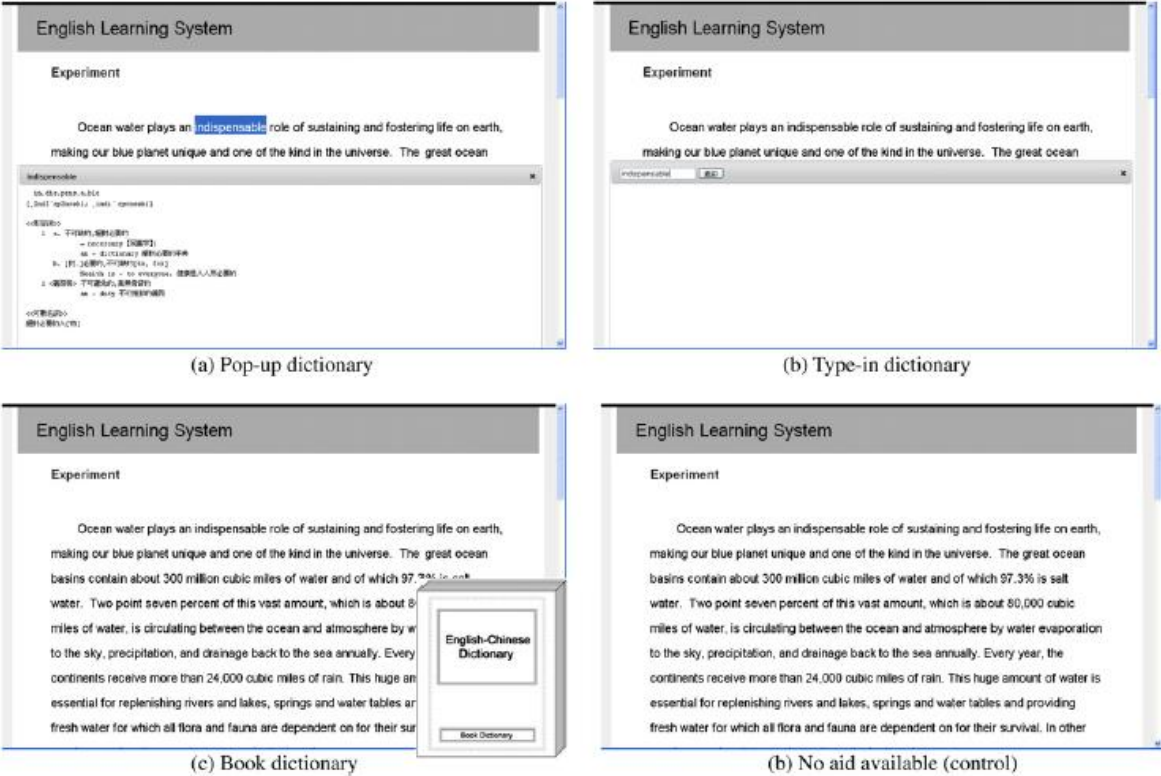


Fig. 1. Four conditions in the experiment.

(Liu & Lin, 2011)