



Differences in the effectiveness of remote online teaching and face-to-face on-campus teaching using the DDL approach in L2 English verb-noun collocations

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Abstract. This study explores the effectiveness of Data-Driven Learning (DDL) approach to second-language (L2) English vocabulary learning in on-demand online distance learning at a private university in Tokyo, Japan. The participants were 49 Japanese undergraduates, intermediate L2 English learners at the B1 level in the Common European Framework of Reference for languages (CEFR). The experimental group consisted of 25 students who completed verb-noun collocation correction tasks between the pre-test, and the post- and delayed post-tests. The control group consisted of 24 students who took the tests but did not perform the error correction task. The results show that for memorizing verb-noun collocations, on-demand online DDL – in which learners refer to screenshots of concordance lines – is as effective as DDL in a traditional on-campus setting, where learners search the Corpus of Contemporary American English (COCA) for themselves, even though the learning activities in remote online on-demand and face-to-face on-campus DDL are not exactly the same. This study suggests the potential of DDL in online on-demand classes. When a variety of teaching methods are being explored, DDL seems a viable option as an approach to L2 teaching.

Keywords: data-driven learning, remote teaching, collocations, error correction.

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1. Introduction

DDL is an inductive discovery learning method in which learners search for words and grammatical items in a corpus and observe examples of their usage; it has been reported to be effective in L2 learning with vocabulary acquisition (e.g. Boulton, 2017). While the teacher, author of this article, has used a DDL approach in face-to-face English classes for about a decade, she used it for the first time in on-demand distance learning classes in 2020 due to the COVID-19 pandemic. This study examines the effects of the DDL approach on L2 vocabulary learning in remote online on-demand classes by comparing them with those in Satake (2021), which was conducted in face-to-face classes on-campus. In this study, a remote online on-demand course refers to a course in which the author uploads self-study materials to the university's Learning Management System (LMS), learners submit assignments, and the teacher provides feedback.

2. Method

The procedure for this study is as follows:

- pre-test (five minutes, Week 1, both the experimental and the control groups);
- two verb-noun collocation correction tasks (Weeks 3-9, the experimental group only);
- post-test (five minutes, Week 10, both the experimental and the control groups);
- delayed post-test (five minutes, Week 15, both the experimental and the control groups); and
- analysis.

Participants were 49 first-year students majoring in history at a private university in Tokyo, Japan, who took a remote online on-demand English course taught by the author in the fall semester in 2020. All students agreed to voluntary participation in this study. The participants were intermediate L2 English learners at the B1 level in CEFR and had been studying English at school for eight years. They were 37 male students and 12 female students, aged 18-20, and all were

native Japanese. The experimental group consisted of 25 students who completed verb-noun collocation correction tasks. They took three tests: the pre-test was given two weeks before the first task, the post-test the week after the final task, and the delayed post-test one month after the post-test; 19 learners took all three tests, so only their data were used. The control group consisted of 24 students who took only the pre-, post-, and delayed post-tests, but did not perform the error correction task; the author used the data from the 21 learners who took all three tests. In each test, the 14 target verb-noun collocations were presented in one sentence each, and the verb parts were fill-in-the-blank questions. The following is an example:

() a deep breath and relax.

The same questions were used for all three tests. The learners were given five minutes to complete each test. If a verb in parenthesis was contextually appropriate, it was not required to be a target collocation verb, and it was considered to be correct. To verify the validity of the tasks, an analysis of variance test was conducted on the results of the pre-, post-, and delayed post-tests for both the experimental and control groups.

For the tasks, the learners were provided with a handout and were asked to read two English sentences containing highlighted unnatural verb-noun combinations with unnatural verb choices, which the author selected (here, ‘unnatural’ means extremely low frequency). They corrected these sentences by referring to the corpus resources, then transcribed the referenced example sentences in English, wrote up their findings in English or Japanese, and submitted their learning record through the university’s LMS. No explicit instruction on appropriate collocation was given after the task. The learners completed 14 sets of verb-noun collocation learning tasks, two tasks each week for seven weeks. [Table 1](#) below shows the 14 target collocations that the learners were likely to use in their writing assignments in the textbook for the course because they are listed as vocabulary to be learned in the textbook. In unnatural verb-noun combinations, ‘do’ was always used, since the unnatural combinations would be natural in Japanese if they were literally translated into Japanese. The following is an example of highlighted unnatural verb-noun combinations; the underlined words were originally highlighted:

Do a deep breath and relax.

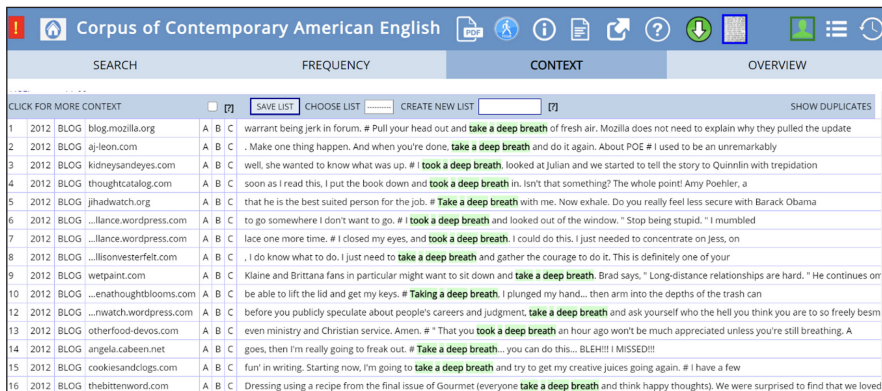
For the qualitative analysis, the author consulted the worksheets submitted by the learners in the experimental group.

As reference materials, screenshots of the concordance lines were used by the learners (e.g. see Figure 1) because the classes were conducted as on-demand distance classes, which did not allow sufficient instruction for the learners to use the corpus directly and appropriately. The author searched the COCA corpus for verbs co-occurring with the nouns of the target verb-noun collocations and distributed the screenshots of concordance lines in which the target nouns co-occurred with three high-frequency verbs, including the correct verb. As a reference corpus, the author used the COCA, a large balanced corpus with an easy-to-use interface (Davies, 2008).

Table 1. Target collocations

1	take a breath	8	make a statement
2	take control of one's life	9	give a speech
3	make a photocopy	10	make a change
4	make a guess	11	take an action
5	take the lead	12	make a contribution
6	give a welcome	13	give a performance
7	make an argument	14	make progress

Figure 1. Example of screenshots of the concordance lines

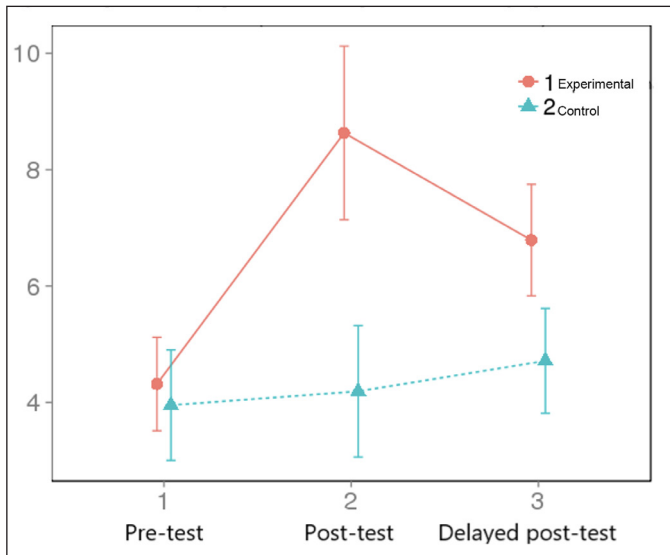


3. Results

As Figure 2 shows, the experimental group showed an increase in the post-test and delayed post-test scores over the pre-test with the mean pre-test score of 4.3, the mean post-test score of 8.6, and the mean delayed post-test score of 6.8, while the control group showed only a minimal change between tests with the

mean pre-test score of 4.0, the mean post-test score of 4.2 and the mean delayed post-test score was 4.7. As the results of the analysis of variance show, there were significant differences in between-group main effects with large effect size ($F(1, 119)=11.879, p=.001, \eta^2=.17$), between-test main effects with medium effect size ($F(2, 119)=52.864, p<.001, \eta^2=.12$), and interactions with medium effect size ($F(2, 119)=40.365, p<.001, \eta^2=.09$). The results of the sub-effect test revealed significant differences between the groups for the post-test (experimental group > control group, $p<.01$) and the delayed post-test (experimental group > control group, $p<.01$). Significant differences were also obtained between the tests for the experimental group (post-test > pre-test, $p<.01$; post-test > delayed post-test, $p<.01$; delayed post-test > pre-test, $p<.01$). Since the post-test and delayed post-test scores were significantly higher than the pre-test scores only in the experimental group, it can be said that DDL, in which learners refer to screenshots of concordance lines in remote classes, is effective for learning verb-noun collocations.

Figure 2. Pre-, post-, and delayed post-test results for experimental and control groups



4. Discussion and conclusions

This study demonstrates that learning verb-noun collocations in remote on-demand classes by referring to screenshots of concordance lines may be as effective as learning to search for verb-noun collocations by learners in face-to-face classes

on-campus (Satake, 2021). Since the learners did not search the corpus themselves but only read the concordance lines selected by the teacher, it is similar to paper-based DDL, which uses printed concordance lines selected by the teacher, and thus there is more teacher intervention and less learner autonomy. The results confirm previous research that computer-based and paper-based DDL are equally effective as L2 learning tools (e.g. Chujo & Oghigian, 2012). Since the DDL in this study does not have an autonomous search, learning may have a qualitative difference from face-to-face DDL in on-campus classes. The learners in this study often made simple statements such as “I found that this verb comes before this noun”, while the face-to-face DDL learners in on-campus classes often described deeper discoveries about the meaning of the verb in the collocation when comparing and determining which verb was appropriate. Qualitative differences in learning could affect the method and amount of output of learned vocabulary, the use of associative knowledge, and other aspects of learned knowledge. However, the results show that simply looking at the given search results without doing a search is effective for the purpose of long-term memory of vocabulary items. This study suggests the potential of DDL in distance learning, which has been accelerated as a new teaching method during the COVID-19 pandemic. Where a variety of teaching methods are being explored, DDL is a viable option as an approach to L2 teaching.

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