Comparison of On-line Dictionaries in Language Learning -Frame vs. Pop-up

YUKA KAWASAKI Graduate School Hyogo University of Teacher Education 942-1 Shimokume, Kato, Hyogo 673-1494 JAPAN

HARUHISA YAMAGUCHI* YUKIKO NITTA**, YUMI YAMAGUCHI*** Department of Education*, Graduate School of Education**, Department of Medicine*** Okayama University 3-1-1 Tsushimanaka, Okayama 700-8530 JAPAN

Abstract: - In this paper, we examine the educational effectiveness and efficiency of on-line dictionaries for language learning by comparing two types of on-line dictionaries, a frame style and a pop-up style. We conducted an experiment in which the participants translated English sentences into Japanese by using a frame style dictionary and a pop-up style dictionary. We found clear evidence that the frame style dictionary is more effective than the pop-up in reading English for Japanese college students. An analysis of the data in the experiments indicated that the participants could read English sentences more accurately with the frame style dictionary than with a pop-up dictionary. That is to say, frame type on-line dictionaries will become a very powerful learning tool in e-Language Learning to enhance learners' reading ability.

Keywords: - e-Learning, on-line dictionary, frame style, pop-up style, language learning, reading

1 Introduction

When we study a foreign language, we look up words in a dictionary. For Japanese language learners, it is an enormous burden to look up a word and find the meaning, because it requires several steps: 1) learners have to find out the radical or stroke numbers of the kanji in the target word in order to use a kanji dictionary, 2) they use a kanji dictionary to find out how to read the word, 3) they look up the word in a dictionary, such as a Japanese-English dictionary. In order to reduce learners' burden in this complicated process, we developed a web site of learning texts with an on-line dictionary for a Japanese reading class in a college in the United States (Figure 1). The students used this web site quite often for doing their homework, and showed strong preferences for the on-line dictionary. We recognized that learning materials with an on-line dictionary on the web site dramatically motivated language learners and promoted their self-study [1].

日本語303~短編集(四)	🦷 旅 【たび】
ж́] [journey] an act of leaving from home for a certain period of time travel / trip / journey / tour
私は松山の高校にいましたが、そこから東京の大学を受験することになりました。兄にお金をもらって予讃線に乗りこんだわけです。そして高松で連絡船に乗り換えて宇野まで行く。そうして初めて四国から外へ出るんです。 その頃は夜行列車だった。瀬戸号に乗って高松まで来ると、もう暗かった。冬で曇っていて、海が真っ暗で。私は生まれて初めて海の上に出た、連絡船に乗って。そうすると、やはり海は美しい、広大なものだと思いました、瀬戸内海ですけれども。そしてこれから自分はどうなるんだろうと思いました。このようにして森のなかの土地づたいの四国を去って、東京でうまく暮らせるだろうかと不安に思いました。その思いはつねにあって、高松というと四国からの出口という感じがまずあります。	2 [move] to go from one place to another trip / journey / tour / travel ~する] [journey] an act of leaving from home for a certain period of time make a journey / trip / journey / tour / voyage / go on a journey / travel / take a trip / make a tour 2 [move] to go from one place to another make a journey / journey / go on a journey / travel / make a tour 私 [わたし / わたくし]
大江健三郎 講演「考える書き方」 (『人生の習慣』岩波書店一九九二)	【わたし】 】 ^I (subject) I / [object] me / myself
	21 【わたくし】

Then, what type of on-line dictionary is the most effective and efficient? The purpose of this study is to find out the most powerful on-line dictionary for language learners by comparing two types of dictionaries, a frame style or a pop-up style.

2 Experiment

We conducted an experiment by using two tests. The participants translated assigned English sentences into Japanese by using two types of on-line dictionaries, a frame style and a pop-up style. Then, we analyzed the test results and examined the speed of participants' translation and the accuracy of their performances.

2.1 Participants

Fifty-two Japanese college students whose majors are not English-related subjects such as English or English education participated in the experiment. We had chosen them so that the participants would not be influenced by any prior knowledge, because we used English test in the experiment. We randomly divided them into two groups, Group 1 and Group 2. Group 1 sat in the front half of the computer classroom and Group 2 sat in the back half of the room. The participants sat with enough room between them so that they couldn't see other participants' answers.

2.2 Testing materials

We prepared two tests, Test 1 and Test 2. Each test has ten English sentences including unfamiliar words for ordinary Japanese college students so that they have to use a dictionary to translate those sentences into Japanese. The purpose of this experiment was to see the effectiveness of on-line dictionaries. Therefore, we used quite simple sentence structures for the test sentences. We added two types of dictionaries to each test, a frame style dictionary and a pop-up style dictionary. From now on, we call them Test 1-frame, Test 1-pop, Test 2-frame, and Test 2-pop. Then, we uploaded these four tests onto our web server (Figure 2 and Figure 3).



Figure 2 Test 1-frame



Figure 3 Test 1-pop

2.3 Procedures

1) We distributed a handout about the experiment and also verbally explained about the experiment.

2) Group 1 took Test 1-frame, and Group 2 took Test 1-pop for twelve minutes.

3) Group 1 took Test 2-pop, and Group 2 took Test 2-frame for twelve minutes.

4) The participants answered questionnaires (4 point scale) and wrote their comments by descriptive method.

3 Results

The average scores on Test 1-frame of Group 1 and Test 1-pop of Group 2 were 17.73 and 18.50 out of 30 points, respectively. Group 2 marked a slightly better score than Group 1. A two-sample *t*-test didn't show a significant difference in the scores in Test 1, which is to say that there was no difference in accuracy between the two groups when they use different types of on-line dictionaries (t = -.74; DF = 50).

The average speed of translating sentences (numbers of the questions that the participants answered) on Test 1-frame of Group 1 and Test 1-pop of Group 2 were 7.19 and 8.26 out of 10 questions, respectively (Table 1). Group 2 translated sentences faster than Group B. A two-sample *t*-test showed a significant difference in the speed in Test 1, which is to say that the participants could translate sentences faster with a pop-up dictionary than with a frame dictionary (t = -2.62; DF = 50).

Table 1. Means of Test 1, speed

Test – dic. type	Mean	SD	Ν	
Test 1-frame	7.19	1.20	26	
Test 1-pop	8.26	1.73	26	*
t = -1.33 * n < .05				

The average scores on Test 2-frame of Group 2 and Test 2-pop of Group 1 were 21.73 and 18.92 out of 30 points, respectively (Table 2). Group 2 marked a considerably higher score than Group 1. A two-sample *t*-test showed a significant difference in the scores in Test 2 (t = -2.36; DF = 50).

Table 2. Means of Test 2, scores

Test – dic. type	Mean	SD	Ν	
Test 2-frame	21.73	3.84	26	*
Test 2-pop	18.92	4.80	26	
t = -2.36 * p < .05				

The average speed on Test 2-frame of Group 2 and Test 2-pop of Group 1 were 9.34 and 8.92 out of 10

questions, respectively. Group 2 answered questions slightly faster than Group 1. A two-sample *t*-test didn't show a significant difference in the speed in Test 2 (t = -1.33; DF = 50).

We also analyzed the data within Groups. The average scores on Test 1-frame and Test 2-pop of Group A were 17.73 and 18.92 points out of 30, respectively. Test 2-pop marked slightly higher than Test 1-frame. A two-sample *t*-test didn't show a significant difference (t = -1.01; DF = 50).

The average speed on Test 1-frame and Test 2-pop of Group A were 7.19 and 8.92 out of 10 questions, respectively (Table 3). Test 2-pop marked higher than Test 1-frame. A two-sample *t*-test showed a significant difference (t = -5.20; DF = 50).

Table 3. Means in Group A, speed

Test – dic. type	Mean	SD	Ν	
Test 1-frame	7.19	1.20	26	
Test 2-pop	8.92	1.20	26	*
$t = -5.20 \ *p < .05$				

The average scores on Test 2-frame and Test 1-pop of Group B were 21.73 and 18.50 out of 30 points, respectively (Table 4). Test 2-frame marked considerably higher than Test 1-pop. A two-sample *t*-test showed a significant difference (t = -3.09; DF = 50).

Table 4.	Means	in	Group	B.	scores
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Test – dic. type	Mean	SD	Ν	
Test 2-frame	21.73	3.85	26	*
Test 1-pop	18.50	3.79	26	
t = -5.20 * n < 0.5				

The average speed on Test 2-frame and Test 1-pop of Group B were 9.35 and 8.27. Test 2-frame marked higher than Test 1-pop (Table 5). A two-sample *t*-test showed a significant difference (t = -3.10; DF = 50).

Table 5. Means in Group B, speed

Test – dic. type	Mean	SD	Ν	
Test 2-frame	9.35	1.08	26	*
Test 1-pop	8.27	1.73	26	
t = -3.10 * p < .05				

The last analysis that we did was to compare the scores and speed between frame type dictionary and pop-up type dictionary in both groups and both tests. The average score of the total of Test 1-frame and Test 2-frame and the total of Test 1-pop and Test 2-pop were 19.73 and 18.71, respectively. The frame type marked higher than the pop-up type. A two-sample test didn't show a significant difference (t = -1.23; DF = 50).

The average speed of the total of Test 1-frame and Test 2-frame and the total of Test 1-pop and Test 2-pop were 8.27 and 8.60, respectively. The pop-up type marked higher than the frame type. A two-sample test didn't show a significant difference (t = 1.23; DF = 50).

4 Analysis

We put the above results in the following table (Table 6).

	score	speed
Test 1	pop-up	pop-up
Test 2	frame	frame
Group A	pop-up	pop-up
Group B	frame	frame
Test 1 and 2 Group A and B	frame	pop-up

Table 6 Higher average and significant difference

statistically significant difference

The strong-lined boxes show a significant difference. The frame type marked three significant differences whereas the pop-up type showed only one significant difference. According to these results, we found that there were correlations between the speed and the score. When the speed was faster, the score was higher. However, when we combined all, Group A, Group B, Test 1, and Test 2, and divided them into two types, the frame and the pop-up, the frame type marked higher score than the pop-up type even though the pop-up marked higher in speed.

This indicates that frame type on-line dictionaries are substantially effective for Japanese college students for learning English.

Furthermore, the participants' comments showed that they preferred a frame type dictionary (Table 7).

Table 7 Numbers of participants in preference for the type of on-line dictionary

Group	frame	pop-up
Group A	16	8
Group B	15	6

5 Discussion

There is a correlation between comprehension ability

and vocabulary ability (Anderson & Freebody 1981, Koda 1989), and earlier research (Kawamura, 2000) reported that it is necessary to improve vocabulary ability to improve reading comprehension in L2 [2], [3], [4]. Laufer (1989) and Nation (2001) observed that learners whose vocabulary size enabled them to understand the meanings of 95% of the words in a text were successful in developing an adequate level of comprehension [5], [6]. Moreover, retention of new words is further determined by the way in which these words are processed, whereby deeper and more elaborate processing results in better word [7].

As these earlier studies said, it is extremely important for learners to study new words in a proper method to enhance their reading comprehension ability. Though this is so, looking up words in a dictionary is one of the hardest and the most time-consuming activities for learners, especially for beginners. In order to reduce their burden and improve their reading comprehension ability, we think that it is essential to provide an on-line dictionary to learners. As we can know by seeing a new term "Blended Learning," which has been used since the early 2000's, a growing number of classrooms have experimented with combining face-to-face and online instruction. John R. Bourne, a professor of electrical and computer engineering at Franklin W. Olin College of Engineering, said that the 80 to 90 percent range of classes could sometime become hybrid (i.e., blended), and that more students choose to take online courses even if they live on campus (cited by J. R. Young, 2002) [8]. This implies that learners will use more on-line study materials in future, and on-line dictionary will be a necessary tool for them to read materials written in their target languages.

Then, what type of dictionary is the most effective? Fry, S. (2007) said that pop-up dictionaries provided a helpful intervention for increasing middle -level learners' reading comprehension in social studies [9]. In our study, the pop-up dictionary performed faster than the frame dictionary in terms of speed of looking up a word. However, the frame type dictionary marked higher score than the pop-up type.

6. Conclusion

In this study, we conducted an experiment to find out which type of dictionary was educationally more effective for Japanese college students to read English sentences, a frame type or a pop-up type. The results of this study show that both types of on-line dictionaries are effective in enhancing learner's reading comprehension. The frame type dictionary marked higher score than the pop-up type, and the pop-up type dictionary marked fast performance than the frame type dictionary.

We would like to suggest that future researchers should conduct more than one experiment with a variety of tests including different languages to obtain more reliable results.

Huang, H. pointed out that online extensive reading could provide more diverse usage and contexts to stabilize the vocabulary acquisition, a step further along the continuum of vocabulary learning (2007) [10]. And in the study by Abel, A. and et al. some participants expressed their wish for multimedia content in on-line dictionaries [11]. Considering all of these elements, and If we can create on-line materials with multimedia contents and an on-line dictionary in the future, e-learning will become a very powerful learning tool.

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