



An Exploratory Study of Tasks & Glosses on L2 Academic Vocabulary Learning*

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ABSTRACT

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The study studied the effects of task types and gloss languages (L1 vs. L2) on academic vocabulary acquisition of the two proficiency groups (English-major vs. Life-long Education) at both short- and long-term periods. Thirty-eight college students in Korea were randomly assigned to one of the four tasks: A reading task with L2 glosses (Involvement Index 1), a reading task with L2 glosses (Index 1), a gap-filling task with L2 glosses (Index 2), and a gap-filling task with L1 glosses (Index 2). The findings showed that there were non-significant learning gains after treatment except the English-major advanced group. Furthermore, there were no significant differences among the four experimental tasks in both groups. The theoretical and pedagogical discussions were made at the conclusion.

KEYWORDS

academic vocabulary, task-induced involvement, L1 glosses, L2 glosses, L2 vocabulary, EFL college contexts

1. Introduction

L2 vocabulary learning has been broadly studied in the second language literature. Laufer and Hulstijn (2001) proposed the task-induced involvement load hypothesis to explain how to develop L2 vocabulary, based on the depth of processing theory of Craik and Lockhart (1972). In other words, the greater depth of processing the learners are involved with the vocabulary learning, the better and more intense quality of information processing they can do, which will lead to L2 vocabulary acquisition (Hulstijn and Laufer 2001). According to the hypothesis, the learners' involvement load in the task can be defined through the involvement factors such as need, search, and evaluation. In other words, words that learners process with a higher involvement load in the task will be retained better than those with a lower involvement load (Laufer and Hulstijn 2001). A lot of empirical studies have supported the involvement load hypothesis (Hulstijn and Laufer 2001, Keating 2008; Kim 2011, 2015, Park 2017, Soleimani and Rahamanian 2015, Sung 2016), while some studies failed to show positive results (Li 2014, Park and Oh 2015).

On the other hand, other branches of L2 scholars suggested that the pedagogical intervention through glossing from incidental reading can be helpful for L2 vocabulary acquisition (Yanagisawa, Webb, and Uchihara 2020). Substantial portions of research have investigated the effects of glosses (Hulstijn, Hollander, and Greidanus 1996, Ko 2012, 2017, Nagata 1999, Watanabe 1997, Xu 2010, Zhao and Ren 2017) on L2 vocabulary development. These studies indicated that glossed reading led to significantly greater learning of words than nonglossed reading (Yanagisawa et al. 2020). In addition, previous studies reported that L1 glosses generally led to better vocabulary learning gains than L2 glosses. These studies also indicate that there was no significant interaction between gloss languages and proficiency.

However, most of the previous studies have studied general vocabulary acquisition rather than academic vocabulary, which could be crucial in academic success at the university level (Gablasova 2014, Nagy and Townsend 2012). Academic vocabulary acquisition has been investigated extensively in second language contexts or content-based language programs (Grim 2008, Joe 2010, Jozwik and Douglas 2017, Roling 2017), while there have been only a few studies concerning academic vocabulary learning in foreign language learning contexts (Kang 2020, 2022). In addition, the previous studies have exclusively dealt with either task or gloss language effectiveness. Therefore, the study aimed to answer the following questions:

- (1) Are there any significant learning gains of academic vocabulary on the four conditions: A reading task with L2 glosses, a reading task with L1 glosses, a fill-in-blank task with L2 glosses, and a fill-in-blank Task with L1 glosses?
- (2) Are there any significant differences between the two proficiency groups of English-major and lifelong adult learners in learning gains of academic vocabulary?

2. Literature Review

Craik and Lockhart's (1972) depth of processing theory suggested that new information in long-term memory is retained by the degree of the depth with which it is originally processed. Based on the processing theory, Laufer and Hulstijn (2001) suggested that the student's degree of task involvement would determine the retention of the new words in long-term memory. Laufer and Hulstijn (2001) further proposed the task-induced involvement hypothesis, where the degree of involvement is determined by the three factors: Need, Search, and Evaluation. First of all, as far as the need factor is concerned, the learners' need for the target vocabulary is moderate when it is triggered by an external agent while it is strong when sought by themselves. Secondly, the search factor refers to what learners try to find the meaning of a target word by using a dictionary or consulting a teacher. Finally, the evaluation factor refers to a judgment of a given word with other expressions in the context. When learners simply recognize differences between words in a given context, it is considered moderate. On the other hand, it's referred to as strong when they should decide forms of words or additional words in a sentence or text. Therefore, tasks with a higher involvement load index would help learners remember more words than those with a lower involvement load index.

A lot of studies have supported the involvement load hypothesis fully (Hulstijn and Laufer 2001, Kim 2011, Soleimani and Rahamanian 2015) or partly (Keating 2008, Kim 2015, Park 2017, Sung 2016), but other studies did not find positive results (Li 2014, Park and Oh 2015). The original proponents of the Involvement Load Hypothesis proponents, Hulstijn and Laufer (2001), tested the hypothesis in vocabulary acquisition (2001). They found that the learners performing tasks with higher involvement load retained words better than those in the tasks with lower involvement load, which was supported by the subsequent study of Kim (2011). Kim (2011, 2015) further suggested that the hypothesis could be applied to vocabulary learning of low-level English learners. These studies indicate that the more involved in the task the learners were, the more words they retained regardless of proficiency levels. However, Keating (2008) revealed that the advantages of the tasks with the higher involvement task load reduced controlling time on task.

However, other studies showed that the hypothesis could not maintain until the long-term period (Park 2017, Sung 2016). For example, in Sung (2016) and Park (2017) with EFL college and adults respectively, they found the task-induced involvement hypothesis did not sustain in the long-term period. Furthermore, the involvement load hypothesis was not validated in other studies (Li 2014, Park and Oh 2015). Park and Oh (2015) did not find any statistically significant differences among the three different involvement tasks such as a reading task with glosses, a filling-gap task with glosses, and a filling-gap without glosses. Li (2014) studied the effects of task-induced online learning tasks on incidental vocabulary acquisition, where tasks assumed with higher involvement loads did not necessarily lead to higher retention scores.

On the other hand, the task involvement loads are related to the glosses provided in the text, which could help the learners to find the meaning of the target words during the incidental reading. There has

been tremendous research on the effects of glossing on L2 vocabulary acquisition from incidental reading. The recent meta-analysis of Yanagisawa et al. (2020) indicated that the provision of glosses in reading resulted in more positive vocabulary learning than nonglossed reading. For example, Hulstijn, Hollander, and Greidanus (1996) found that the marginal glosses resulted in much better word retention scores than the dictionaries. Watanabe (1997) also reported that both single and multiple marginal glosses significantly improved word acquisition and retention on the delayed test better than the no explanation and the appositive conditions, but that no statistically significant difference appeared between the two gloss conditions.

As far as gloss languages were concerned, all gloss languages, either L1 or L2, led to significantly greater learning gains compared to the nonglossed condition. Multiple comparison analyses by Yanagisawa et al. (2020) further showed that L1 glosses contributed to higher learning gains than L2 glosses, but that there were no significant differences between L1 plus L2 glosses and L1 and between L1 plus L2 glosses and L2. Furthermore, they reported whether L2 proficiency levels could interact with different gloss languages. They did not find any significant interaction between gloss languages and proficiency in both immediate and delayed posttests. In other words, L1 glosses produced greater learning than L2 glosses regardless of the L2 proficiency levels of the learners.

For example, Ko (2012) studied how three types of glosses, No glosses, L1 glosses, and L2 glosses, could influence L2 vocabulary learning in Korea. The findings showed that the glossed conditions led to more significant learning than the no-gloss condition, but that there were no significant differences between L1 and L2 gloss conditions on both the immediate and delayed posttests. Xu (2010) examined the effects of the three types of glossing (i.e. glossing in both L1 and L2, L1 glossing, and L2 glossing) on incidental vocabulary acquisition. The result showed the better effects of either L1 or L1 plus L2 glosses over L2 glosses on vocabulary learning. Choi (2016) further studied the effects of gloss languages (L1 vs. L2) and frequency (F2 occurring twice vs. F4 occurring four times) on L2 vocabulary learning. It was shown that there was no difference in their short-term retention of both F2 and F4 words, but that the L1 group retained the F4 words more significantly than the L2 group in the long-term period, but not F2 words.

Other researchers investigated whether there could be significant interaction between gloss languages and proficiency (Ko 2017, Zhao and Ren 2017). Ko (2017) examined the relationship between L2 proficiency and four types of glosses (no-gloss, L1 gloss, L2 gloss, and L1 plus L2 gloss). The results showed that either the L1 gloss or the L1 plus L2 gloss was more effective for low proficiency levels, while either the L2 gloss or the L1 plus L2 gloss, more effective for higher levels. The participants also reported that the L1 plus L2 gloss type was the most preferred one. Zhao and Ren (2017) further investigated the effects of L2-gloss frequency and learner proficiency of Chinese university students on L2 lexical learning in three conditions of the incidental reading: No gloss (NG), High-frequency L2 gloss (HFLG), and Low-frequency L2 gloss (LFLG). They found that the glossed groups significantly outperformed the non-glossed group in immediate recall and recognition, but that the gloss frequency effect (HFLG) occurred with lower proficiency participants only. In addition, there were no differences

in word recall between the two proficiency learners in the HFLG condition, while the higher proficiency group outperformed the lower proficiency group at the immediate posttest in the LFLG condition.

On the other hand, considering the college context, most of students should read academic texts, so academic vocabulary should be a must-do to do research (Nagy and Townsend 2012). Nagy and Townsend (2012) defined academic language as “the specialized language, both oral and written, of academic settings that facilitates communication and thinking about disciplinary content” (p. 3). However, most of the previous studies on vocabulary learning through tasks or glosses have been focused on general vocabulary, but only a few studies indicated the possibility of task or gloss effectiveness on academic vocabulary (Gablasova 2014, Kang 2020, 2022). Gablasova (2014) indicated that L1 or bilingual instruction could play a useful role in the acquisition of academic vocabulary. He studied the specialized vocabulary acquisition from L1 and L2 textbooks by Slovak high school intermediate or advanced students studying English. The results showed that the L2-instructed students recalled fewer word meanings after the reading and they acquired the words to a lesser depth than the L1-instructed counterparts.

More specifically, Kang (2020) studied the effects of task-induced involvement on academic vocabulary development at short- and long-term periods in Korean college contexts in three conditions: A reading task without a glossary, a gap-filling task with a glossary, and a gap-filling task without a glossary. The reading task without a glossary was found to be more effective in the acquisition of academic vocabulary than either the gap-filling task with or without a glossary. This study indicates that academic vocabulary could require more intensive reading processing. Kang (2022) investigated the effects of multiple-choice glosses (MCGs) and types of language (L1 vs. L2) and frequency on L2 academic vocabulary retention in Korean university contexts. The study showed significant academic vocabulary learning after the provision of MCGs from incidental academic reading. However, there was some interaction between the types of gloss languages and the participants’ proficiency levels. The lower level learners more significantly benefited from L1 MCGs, while the advanced level, from L2 MCG. The study further revealed that the learning of academic words required at least 6 times regardless of the type of gloss language.

3. Method

3.1 Participants

Thirty-eight students studying at both English Language & Literature Dept. and Life-long adult education at a university, Seoul, participated in this study in the fall semester of 2022. The English-major students were highly proficient in English while the Life-long adult learners were poor in English. Their TOEIC scores in total ranged from 400 to 975 ($M = 745$) except for 16 students who

have not taken the test before. However, the mean scores of English-major and Life-long adults were 830 and 520 respectively.

3.2 Research Design

For the study, the researcher chose a reading passage that they have not studied in class from the academic textbook (Richard & Rodgers 2014, pp. 317-318). Eleven unfamiliar words were selected from the reading passage. The participants in both English-major and life-long adult education were pre-tested before treatment, post-tested after treatment, and delayed post-tested two weeks later after treatment. For the experimental treatment, they were assigned each of the four tasks, as shown in Table 1: (Task 1) a reading task with L2 glosses (Involvement Index 1); (Task 2) a reading task with L2 glosses (Involvement Index 1); (Task 3) a gap-filling task with L2 glosses (Involvement Index 2); and (Task 4) a gap-filling task with L1 glosses (Involvement Index 2). All groups were given the same amount of time (40 minutes) to finish their tasks.

Table 1. Experimental Design

Tasks	Task 1	Task 2	Task 3	Task 4
Treatment & Gloss languages	Reading comprehension & L2 glossary	Reading comprehension & L1 glossary	Reading with a L2 word list & gap-fill	Reading with a L1 word list & gap-fill
Involvement loading	moderate need, no search, & evaluation (1)	moderate need, no search, & evaluation (1)	moderate need, no search, & moderate evaluation (2)	moderate need, no search, & moderate evaluation (2)

The students in Tasks 1 and 2 were asked to read the passage with the 11 target words highlighted in bold with either L2 or L1 glosses respectively and answer the accompanying reading comprehension questions. In terms of the involvement load, both reading tasks with glosses induced moderate need (1), no search (0), and no evaluation (0), which indicated an involvement index of 1 (Hulstijn & Laufer 2001). On the other hand, the students in Tasks 3 and 4 were given the same text as those in Tasks 1 and 2. However, the eleven target words were deleted from the passage, leaving 11 gaps numbered 1–11. Then, they were required to read the text, fill in the eleven gaps with either L2 or L1 glosses in the word lists respectively at the end of the passage, and answer the same reading comprehension questions. In terms of the involvement load, both tasks induced moderate need (1), no search (0), and moderate evaluation (1) in the provision of the context. Its involvement index for the gap-fill tasks with glosses was 2.

To assess the participants' vocabulary knowledge in pre- and posttests, the researcher graded the vocabulary test items, following the vocabulary knowledge scale (VKS) (Paribakht and Wesche 1997), as follows:

- I. I have never seen this word before. (0)
- II. I have seen this word before, but I don't know what it means. (1)
- III. know its meaning. (2)
- IV. I can use this word in a sentence. (3)

Categories I and II for the test items were assigned zero and one point respectively. Category III and IV were designed to assess receptive and productive word knowledge, and Category respectively, and then the students were given 2 or 3 points depending on the correct answers to the test items. For the data analyses of the research questions, the researcher conducted a paired-samples t-test to see any learning gains in academic vocabulary after treatment, followed by a one-way analysis of covariance (ANCOVA) to compare vocabulary scores among the four experimental groups. The ANCOVA was designed to control the pre-test scores as covariance.

4. Results

4.1. Effects of Experimental Treatment on L2 Vocabulary Learning

The descriptive statistics in Table 2 showed the vocabulary scores of the pretest, the posttest, and the delayed posttest of the experimental groups. For example, the pretest, their posttest, and delayed posttest mean scores of the participants in total were 1.27, 1.40, and 1.58 out of the total score (3) respectively.

Table 2. Descriptive Statistics

Tasks & Glosses	Paired Samples	Mean	N	SD
Total	Pretest	1.27	38	.62
	Posttest	1.40	37	.65
	Delayed Test	1.58	20 ¹	.33
L2 Glosses	Pretest	1.00	7	.76
	Posttest	2.00	7	.42
	Delayed Test	1.75	2	.21
L1 Glosses	Pretest	1.48	9	.64
	Posttest	1.84	9	.46
	Delayed Test	1.42	5	.15
L2 Fill-in-blank	Pretest	1.28	12	.61
	Posttest	1.83	12	.45
	Delayed Test	1.55	8	.31
L1 Fill-in-blank	Pretest	1.27	12	.46
	Posttest	1.90	12	.59
	Delayed Test	1.71	8	.47

¹ The life-long group missed the delayed test, so the statistical analyses of the delayed tests were not carried out.

First of all, the paired-samples t-statistics in Table 3 showed that there was no significant difference between the pre-test and posttest scores. In other words, there was no positive effect of the treatment (tasks and glosses) on the vocabulary score of the experimental group in total ($p = .084 > .05$). To see if there was any difference between the experimental groups, ANCOVA statistics were conducted, as shown in Table 4. The analysis produced no significant result for the posttest ($F = 1.260$, $p = .305$). In addition, the independent variable explained only 10.6% of the variance in the dependent variable (the post-test) (eta squared = .106).

Table 3. Paired-samples T-Statistics

Paired Samples	Mean Difference	SD	<i>t</i>	<i>p</i>
Pretest — Posttest	-1.30	.44	-1.78	.084

$p < .05^*$, $p < .01^{**}$

Table 4. ANCOVA Results

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig</i>	Eta Squared
Corrected Model	9.425 ¹	4	2.356	12.834	.000	.616
Intercept	.810	1	.810	4.412	.044	.121
Pretest	8.498	1	8.498	46.218	.000	.591
Group	.694	3	.231	1.260	.305	.106
Error	5.875	32	.184			

¹R Square = .616 (Corrected R Square = .568)

4.2. The Experimental Effects on L2 Vocabulary Learning of English-Major Group

The following descriptive statistics in Table 5 showed the vocabulary scores of the pretest, the posttest, and the delayed posttest of the students majoring in English Language & Literature. The pretest, their posttest, and the delayed posttest mean scores of the participants in total were 1.56, 1.86, and 1.58 out of the total score (3) respectively. It seems that most of the experimental groups improved their scores on the posttest, but their delayed test scores decreased.

The paired-sample t-statistics in Table 6 showed some positive effects of the treatment on academic vocabulary learning. Table 6 indicated that the vocabulary score of the English-major group significantly improved from pretest to the posttest ($p = .010 < .05^*$), but its effect on academic vocabulary learning did not sustain in the delayed test in total ($p = .796 > .05$).

The ANCOVA results in Table 7 showed how different the participants' vocabulary learning gains were in both the posttest and delayed test among the four experimental groups. The statistical analysis produced no significant results for the posttest ($F = .78$, $p = .524$) and delayed test ($F = 1.16$, $p = .362$). The independent variable explained only 14.3% and 19.8% of the variances in the dependent variables (the posttest and delayed post-tests) (eta squared = .143 and .198) respectively.

Table 5. Descriptive Statistics of English-Major

Glossing	Paired Samples	Mean	N	SD
Glosses in Total	Pretest	1.56	21	.59
	Posttest	1.86	20	.45
	Delayed Test	1.58	20	.33
L2 Glosses	Pretest	2.05		.35
	Posttest	2.00	2	.42
	Delayed Test	1.75		.21
L1 Glosses	Pretest	1.80		.47
	Posttest	1.84	5	.46
	Delayed Test	1.42		.15
L2 Fill-in-blank	Pretest	1.43		.69
	Posttest	1.83	8	.45
	Delayed Test	1.55		.31
L1 Fill-in-blank	Pretest	1.38		.50
	Posttest	1.90	6	.59
	Delayed Test	1.71		.47

Table 6. Paired-samples T-Statistics of English-Major

Paired Samples	Mean Difference	SD	t	p
Pretest — Posttest	-.29	.45	-2.86	.010*
Pretest — Delayed	-.035	.60	-.263	.796

$p < .05^*$, $p < .01^{**}$

Table 7. ANCOVA Results of English-Major

Source	Dependent Variables	Type III Sum of Squares	df	Mean Square	F	Sig	Eta Squared
Corrected Model	Posttest	2.013 ¹	4	.50	3.87	.03	.525
	Delayed Test	.496 ²	4	.12	1.14	.38	.246
Intercept	Posttest	1.37	1	1.37	10.53	.006	.429
	Delayed Test	2.90	1	2.90	26.63	.000	.655
Pretest	Posttest	1.96	1	1.96	15.06	.002	.518
	Delayed Test	.20	1	.20	1.79	.202	.113
Group	Posttest	.31	3	.10	.78	.524	.143
	Delayed Test	.38	3	.13	1.16	.362	.198
Error	Posttest	1.82	14	.13			
	Delayed Test	1.52	14	.11			

¹R Square = .525 (Corrected R Square = .389), ²R Square = .246 (Corrected R Square = .31)

4.3. The Experimental Effects on L2 Vocabulary Learning of Lifelong Education Group

Table 8 showed the descriptive statistics of the lifelong education group. The pretest and posttest mean scores of the participants were .92 and .85 out of the total score (3). It seems that their scores were relatively low, compared with the English-major experimental group in section 4.2. According to paired-sample t-statistics in Table 8, the treatment did not affect the academic learning of the lifelong education group ($p = .511 > .05$). The ANCOVA results in Table 9 showed there were no significant

differences in the posttest among the four experimental groups ($F = .48$, $p = .702$). In addition, the independent variable explained only 10.7% of the variance in the dependent variable (eta squared = .107).

Table 8. Descriptive Statistics of Lifelong Education

Glossing	Paired Samples	Mean	N	SD
Glosses in Total	Pretest	.92	17	.43
	Posttest	.85	17	.86
L2 Glosses	Pretest	.58	5	.24
	Posttest	.75		.35
L1 Glosses	Pretest	1.08	4	.64
	Posttest	.78		.38
L2 Fill-in-blank	Pretest	.98	4	.29
	Posttest	.93		.29
L1 Fill-in-blank	Pretest	1.10	4	.41
	Posttest	1.00		.47

Table 9. Paired-samples T-Statistics of Lifelong Education

Paired Samples	Mean Difference	SD	t	p
Pretest — Posttest	.06	.36	.672	.511

$p < .05^*$, $p < .01^{**}$

Table 10. ANCOVA Results of Lifelong Education

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Eta Squared
Corrected Model	.864 ¹	4	.216	2.24	.126	.427
Intercept	.264	1	.264	2.73	.124	.186
Pretest	.669	1	.669	6.93	.022	.366
Group	.139	3	.046	.48	.702	.107
Error	1.158	12	.097			

¹R Square=.427 (Corrected R Square=.237)

5. Conclusion

The study showed the effects of four types of tasks with gloss languages (L1 vs. L2) on L2 academic vocabulary development. First of all, the paired-sample t-statistics indicate that the experimental treatment did not have positive effects on the academic vocabulary development between the pre-test and posttest scores. In addition, the ANCOVA statistics revealed that there were no significant differences in academic vocabulary acquisition among the four experimental conditions either.

However, the statistics in the experimental effects on the learning gains revealed some differences between English-major and life-long education groups. For example, the paired-samples T-statistics between pre-tests and post-tests indicated that the learning gain in the English-major group was significant between the pretest and posttest, while the learning gain in the life-long education group was

non-significant even though there were no significant differences among the experimental tasks of both groups. Therefore, the non-significant effect of the learning gains with the whole group should be due to the life-long education group.

It seems that the findings did not support the involvement load hypothesis (Hulstijn and Laufer 2001, Laufer and Hulstijn 2001). According to the hypothesis (Hulstijn and Laufer 2001), the greater depth of processing the learners are involved from the incidental reading, the better quality of information processing they can do. But what could happen if academic reading requires heavy cognitive processing on reading comprehension? The learners' processing of L2 vocabulary could be limited. Kang's (2020) study could explain why the task-induced involvement hypothesis was not working with the academic vocabulary. Kang (2020) reported that the input-oriented tasks, which usually induced more in-depth processing on reading comprehension, led to better academic vocabulary acquisition than output tasks. It could be because input tasks allowed students to usually induce more in-depth processing on reading comprehension than output tasks, eventually leading to more retention of the academic words.

Furthermore, the present study revealed that gloss languages (L1 vs. L2) did not seem to affect academic vocabulary development unlike the previous studies in the general vocabulary acquisition (Jacobs, Dufon and Hong 1994, Watanabe 1997, Yanagisawa et al. 2020). It could be since knowing the technical vocabulary is very closely related to knowing the subject area (Nation 2013). That is why proficiency level plays a key role in academic vocabulary acquisition. Therefore, we should provide more academic context or background information before applying the task-induced or gloss language effects to academic vocabulary development.

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Examples in: English

Applicable Languages: English

Applicable Levels: Tertiary