

The Effect of Task-Related Involvement Load and Cross-Modality on Vocabulary Learning

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Abstract. Involvement load hypothesis has attracted the wide attention from researchers in the past decade; yet it still remains controversial due to inconsistent results from previous studies. The present study reports the findings of an experimental study investigating the effects of task-related involvement load and cross-modality (reading while listening) on vocabulary learning. 74 Thai first-year university students were recruited into the study. They were assigned into four groups with vocabulary learning tasks of ascending involvement load indices (2, 3, 4, and 4). The learning target words were 10 pseudo words which were glossed with other 10 distractive words at the back of the reading passages in each task. Cross-modality were integrated into one group task (group 4) so as to be compared with the other group (group 3) with the involvement load controlled. And the adapted Vocabulary Knowledge Scale was used as the test to evaluate these students' performance on vocabulary. Then the perceptions on these tasks by the students was induced through the post-interview. The findings reveal that the increase of involvement load does lead to the higher achievement of vocabulary whereas the similar involvement load tasks may have little difference in vocabulary learning. And cross-modality was found to exert little effects on these learners' vocabulary learning, while learners showed positive attitudes to the effects of the tasks and cross-modality.

Introduction

Vocabulary has long been perceived as a very crucial portion in second language learning by both language learners, teachers and researchers. Vocabulary research has been conducted under mainly the four themes: measurement of vocabulary size, nature of word knowledge, process of learning, and establishing word lists (Hirsh, 2012). Among these directions, Involvement Load Hypothesis (ILH) has attracted wide attention since its birth in 2001 with the paper by Laufer and Hulstijn (2001). The proposition of such a hypothesis aims to solve the extant problems in relation to the depth of processing on vocabulary learning and retention. Although positive evidences abounds for the hypothesis so far, the opposing voice still exists. Therefore, it is still of value to investigate such an issue; on the other hand, most of the previous studies are limited to the three form-focused tasks types, that is, reading comprehension, gap-filling and writing tasks. Taking into account of this point, the present study extends the work on involvement load by using the translation tasks to supersede the previous writing tasks, as the translation tasks have received little attention in probing into the issue of ILH.

Learning modality is often known as learning channels or senses to describe learning styles. Using more than one modality (cross-modality) in language learning has in a long history been used as a remedy for developing children's first language literacy (Beers, 1998). Recently several studies have indicated that cross-modality, especially, listening while reading can promote vocabulary learning in the extensive reading (Brown, Waring, and Donkaewbua, 2008; Webb, Newton, & Chang, 2013). Yet

little research has worked to combine the investigation of cross-modality and ILH in vocabulary learning, which gap is bridged in the present study.

Vocabulary Learning in Second Language Context

It seems widely acknowledged that vocabulary learning plays a pivotal role in language learning. With reference to Wilkins (1973), "...without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (pp. 111–112). As stated by Lewis (1993) "lexis is the core or heart of language" (p. 89). In sum, the vocabulary is perceived as a marrow of language knowledge for successful communication to occur in L1 and L2 speakers. Besides, L2 learners have realized the importance of vocabulary through their own learning experiences. It can be noted that "learners carry around dictionaries and not grammar books" (Schmitt, 2010, p. 4).

On the other hand, "Language is very difficult to put into words." as stated by Voltaire (1694-1778). English has been reported to involve a large number of words ranging from 400,000 to 600,000 words (Claiborne, 1983). However, only a small number of words are learned through formal study (Schmitt, 2000) which may leave the other large sum of words to be learned incidentally through extensive exposure to language.

Involvement Load Hypothesis

In order to simulate theoretical thinking and empirical research in L2 vocabulary learning, Laufer & Hulstijn (2001) propose Involvement Load Hypothesis. The basic contention of the construct is that the higher involvement load a task is with, the more likely the learners will learn and retain the vocabulary practiced in the task. The operationalization of the concept "involvement load" is realized by three sub-elements, namely, need, search and evaluation.

Need is the motivational, non-cognitive dimension of construct. It refers to the drive or force that is needed in achieving the task, which can be externally exposed or intrinsically motivated. It has two involvement indexes, strong need with indexing being 2 and moderate need with index being 2. For instance, if the students feel the need to look up the dictionary when he is confronted with some unfamiliar words which influences his normal reading, the need is strong. When the learners are instructed by teachers to look up some unfamiliar words or write some sentences with the target words, the need is moderate.

Search is to find out the meaning of unfamiliar words in a task. There are also two involvement indexes for search, absence and strong presence. When search is present, the involvement index is 1. When search is absent, the index is 0. Search occurs when the learners look up the dictionary or consult for an authority (a teacher) when they come across the unknown words in one task. Search is absent, when no efforts are made by learners, for example, no consultation for dictionary or authority for the unknown words, or words are glossed in the margin.

Evaluation is the attempt to make comparison of the given word with others, or associate the words with others in an original test. Evaluation has three degrees, strong, moderate and absent. Evaluation is moderate with the index being 1, when the learners are given a task to compare the words meaning and choose which one is more suitable to a specific blank or when learners should choose the right word in a given text on the condition that the homonyms occur. The evaluation is strong with the index being 2, when the learners are required to use the target words to write a composition.

Learning Modality

Modality is often seen as the channels or senses used to describe the learning style, which with a couple of theories, aims to explain the individual differences of learning (Coffield, Moseley, Hall & Ecclestone, 2004). Barbe, Swassing and Milone (1979) proposed three learning modalities as visualizing modality, auditory modality and kinesthetic modality, and the strengths of these modalities can occur independently or in combination and change over time.

In the context of L2 learning, recent studies have investigated the effects of different task modalities on learners' language performance. Such task modalities specifically focus on learners'

written and spoken production. Ellis and Yuan (2005) investigated the effect of online planning on learners' L2 written and oral production with modality here (the written or spoken task) viewed as a variable in task design. And it was found that modality overtook the planning in affecting learners' production of accurate language; that means, L2 learners tended to use more accurate language in the written task than the spoken task.

Another practice relating the modality with language learning is the assisted reading with oral rendition in developing first language literacy and as a remedy for the children who have listening difficulties; such practice has lasted for a long history (Beers, 1998). Recently, several inquiries examined the effects of cross-modality of tasks on vocabulary learning. Brown et al. (2008) researched on the vocabulary learning of Japanese L2 learners through reading grade 3 readers. They assigned the subjects into three tasks with different input modality: reading, reading while listening and listening. Results showed that most of vocabulary were learned in reading while listening context. Similar finding was concluded in Webb et al. (2013) that assisted repeated reading with listening generated more vocabulary learning on the Taiwanese L2 learners than repeated reading alone, for which three reasons were given in Webb et al. (2013) in terms of audio-assisted reading. The listening task can contribute to more comprehension on the text and have learners spare the more attention on unfamiliar words (Webb et al., 2013). And then listening can help learners to organize larger chunks from words so as to promote the text comprehension and the unknown words' learning (Brown et al., 2008). Lastly, listening can enhance learners' potential to link form to meaning (Webb et al., 2013).

Methodology

Participants

The participants were 80 first-year students who were studying English II at Suranaree University of Technology. The students were randomly divided into four groups (twenty students in each group) to complete four different tasks. But there were 6 students didn't do anything. Finally, 17, 17, 18 and 22 students were in group one, two, three, and four respectively.

Instrument

The instruments of the present study covered four tasks inducing varied loads of involvement and a test on vocabulary followed by an interview.

Passages Selection

The genre and topic familiarity were considered in selecting passages. Gardner (2004) showed that learners benefit more in vocabulary learning from narrative reading than expository reading. Pulido (2007) showed that topic familiarity has a crucial impact on incidental vocabulary learning. In order to control these two factors, the present study chose two narrative stories entitled *Who was the thief?* (New Concept English II), 150 words and *Ana Johnson* (Cambridge English), 203 words.

Target Words

Laufer's (1992) study showed that if the learners vocabulary knowledge is lower than ninety-five percent of the context, then the guessing ability of the learners to guess the words successfully will be severely reduced.

In these two passages, the ten pseudo words were chosen as the target words. The percentages of unknown words are three point three percent in passage one and two point four percent in passage two, which indicates that passages with certain difficulties are appropriate for students to catch the global meaning of the text. Also, verbs and nouns are the frequent type of words used in the text. This study chose adjective and adverb in addition. Therefore, the target words included four nouns, two verbs, three adjectives and one adverb. They were: piner (n. น้กสีบ), intinency (n. ความพยายาม), huncicles (n. บทความ), rengo (up)(v. ห่อ), dintally (adv. อย่างรวดเร็ว), glite (adj. ว่าง), tacsiz (v. ฝึกปฏิบัติ), tarent (adj. แตกต่าง), klutial (adj. สำคัญ), and goe (n. ความสนุกสนาน). In addition, ten words were provided for distracters.

Task Design

Task one was a reading comprehension task with marginal glossaries where students were provided with two passages, and twenty words were glossed in Thai in the margin and the direction for them was chosen the correct answer from the three multiple choices. The involvement index of this task was (1, 0, 0). Task two consisted of a reading comprehension task with marginal glosses followed by a blank-filling task where students were asked to fill the blanks using the glossed words. The involvement index of this task was 2 (1, 0, 1). Task three consisted of a reading comprehension task with marginal glosses and a translation translation task. In the translation task, students have to translate the sentences by using the target words. The involvement index of this task was 3 (1, 0, 2). Task four was similar to task three except that the audio file was offer to students so that while they were doing the reading task, they must keep on listening to the audio. After that, they continued to perform the translation task. The involvement index of this task was 3 (1, 0, 2).

Table 1 is a table that shows the distribution of involvement index; plus (+) refers to the presence of the factor, or the moderate level (1), minus(-) refers to the absence of the factor (0), and double plus (+ +) refers to the presence of the factor, or the strong level (2).

Table 1. The tasks and the involvement load index.

Groups	Task	Need	Search	Evaluation	Involvement index
Group 1	Reading comprehension	+	-	-	1
Group 2	Reading comprehension and blank-filling	+	-	+	2
Group 3	Reading comprehension and sentence translation	+	-	++	3
Group 4	Reading comprehension while listening and sentence translation	+	-	++	3

Vocabulary Knowledge Scale

The test used in the present study was the modified version of vocabulary knowledge scale based on Vocabulary Knowledge Scale (VKS) designed by Paribakht and Wesche in 1997. VKS has been proved to be a workable measure of incidental vocabulary acquisition in their research because of their reliability and validity (Paribakht and Wesche, 1997). There are three choices I, II and III. Accordingly, the point scale ranged from zero to two, the maxim score twenty would be achieved if the learners can write the correct sentence with the target word, the minimum score zero could also be possible if the learners don't know all the vocabulary. Scale:

I: zero point: I haven't seen this word.

II: one point: I have seen this word, and wrote the correct meaning of it.

III. two points: I have seen this word, and translated the sentence correctly.

If the learners chose III, but can not translate the sentence correctly, then he will get one point. Also, if the learners chose III, he should do II.

Procedures

The teachers in charge of the two English classes were trained in advance. They were told that the experiment would be carried out in normal class time. The students would not be told they have a test. The teacher declared it was a quiz to test students' reading abilities, and their performance were recorded in the middle examination. Therefore, the students were highly motivated. The students in each class were arranged randomly into two groups, because they were all from two parallel classes and the target words are pseudo words. All the students had thirty minutes to go over the paper they assigned, and each of them received different tasks. The present study required them to complete the task in the same time, which avoided the time influence on the results, for Hulstijn and Laufer's experiment (2011) result was criticized for different time spent on different tasks. After completion, the teacher collected all the paper, and then handed out the unexpected vocabulary test. The vocabulary test lasted ten minutes. At last, the test were collected immediately.

The next step was an in-depth interview. After the test was finished, twelve participants (three from each group) were randomly chosen to be interviewed to see their attitudes towards the effect of the tasks on vocabulary learning.

Data Analysis

In the present study, the dependent variable is students' vocabulary test score. Task was independent variable. The task contained four levels: task one, task two, task three, and task four. The one-way ANOVA method was used to test whether there are significant differences among four groups in immediate test. Content analysis was used in analyzing the interview data.

Findings and Discussion

The findings obtained from the study were analyzed to answer the three research questions:

In response to the question no. 1, "For Thai first-year university students, to what extent does task-related involvement load affect their vocabulary learning?", the findings from the comparison of word recall scores among the four tasks (as shown in Table 3) showed that word recall scores were significantly varied by the tasks designed ($F(3, 70)=5.379, p<0.05$). Bonferroni's post hoc procedures indicated that those who participated in task four, task three and task two learn significantly more words than those who participated in task one respectively. However, there were no significant differences in vocabulary learning between task four, task three and task two.

As shown in Table 2, the result partially supported the involvement load hypothesis proposed by Laufer and Hulstijn (2001). In this research, task four, task three and task two outperformed Task one. Although there was no significance among task four, task three, and task two, the mean score showed task four ($M=6.81$) was higher than task three ($M=6.22$) and task two ($M=6.41$), which indicated that the involvement load might have a certain effect on vocabulary learning.

Table 2. Comparison of word recall scores.

	Task 1 N=17		Task 2 N=17		Task 3 N=18		Task 4 N=22		F (3,70)	Post Hoc (Bonferroni)
	M	SD	M	SD	M	SD	M	SD		
VKS	2.94	2.38	6.41	4.09	6.22	3.68	6.81	3.03	5.075*	Task 4> Task 1 Task 3> Task 1 Task 2> Task 1

Also, comparing task two with task three, the involvement load in task three was higher than in task two, but the mean score of task three was lower than task two. However, we could see from table 2 that the SDs are 4.09 and 3.68 in task two and task three respectively, which showed that the scores in task three was more central than it in task two.

The reasons for no significant differences between task two and task three might be as follows:

Firstly, the previous studies seldom used translation as the task. It might be not easy to discern the involvement load in such task. In this research, we assumed the involvement load is 2 according to our understanding of Laufer and Hulstijn's (2001) involvement load hypothesis. Second, the involvement loads in task three and task two are 3 and 2. According to the previous study (Kim, 2011), if the involvement load is close in different tasks, there might not be significantly different. In this research, the mean scores in task three ($M=6.22$) and task two ($M=6.41$) are close. This gives us an implication that in the future when we design the tasks, we'd better make use of the tasks with obvious involvement load contrast rather than the tasks with similar involvement loads.

Secondly, the translation task used in this study has not been used in previous study. Although we label its involvement load as 2, according to the principles given by Laufer and Hulstijn (2001), there still remain doubts if such an index is reliable or not. There is a possibility that task two and task three share the same involvement load. Therefore, while determining the involvement load in tasks, we should be cautious in considering the previous principles.

Thirdly, in task two, students are required to fill in the blank-filling with the target word, which

might make the students pay more attention on vocabulary. While in task three, students are required to translate the sentence, which makes the students focus on structure as well as words, leading to the result that task two outperformed task three.

In response to the question no. 2, “For Thai first-year university students, to what extent does cross-modality affect their vocabulary learning in the tasks with the same involvement load?”, There were no significant differences found from the statistical analysis between task three and task four, which showed that cross-modality didn’t play significant role in learners’ vocabulary learning. Although countering the previous research on the effects of cross-modality (Brown et al., 2008), this could be explained by Bottleneck theory (Broadbent, 1958) where human-beings are equipped with the limited amount of attentional capacity and the information is processed in a serial order and some information and stimuli are ‘filtered’ when learners carry out more than one tasks at the same time. And only the most salient and important information is perceived. Also, Allport (1980) suggested that interference occurred when similar tasks compete for the same processing mechanisms. Since in the present study, learners were asked to listen to and read the same text source, it could be argued that the similar task led to a competition of attention resource in their processing information, which consequently downplayed their performance. However, the interesting point is that from the interview data, learners perceive the positive effects brought out by cross-modality tasks which will be discussed in the following parts.

In response to the question no. 3, “What are the students’ perceptions to the effectiveness of the tasks?”, the qualitative data were collected from online questionnaire and in-depth interviews. Both techniques took use of the similar questions while the questionnaire were intended for the whole group of participants and the interview was conducted to the selected participants (three from one group). The additional use of the questionnaire aimed to cover the vocabulary learning conditions of the whole groups. After the data were collected, we tried to code the themes separately, and after that we integrated our views on our coding. The data were coded and coded from several times before several themes were derived below to detect the perception of our participants on the tasks and vocabulary learning.

The Tasks are Beneficial to Their Learning

All the interviewed students mentioned that they could be able to learn the vocabulary from the tasks; some of them could even recall some target words in the tasks (one has an active recall and two make passive recalls). Similar results were drawn from the questionnaires that most of these participants wrote that they were able to learn the vocabulary through the tasks. Therefore, we could capture the perception of these students on the tasks that they got promoted in the vocabulary learning, particularly the learning of target words.

Still the perceptions of these students on the tasks are diverse. The students from group 3 and 4 mentioned that the tasks were a bit or very difficult and the students from group one and two thought that the tasks were not very difficult. These perceptions held by these students could simply reflect the involvement loads they perceived on the tasks, that is, the higher the involvement load, the more difficult the task should be. In this case, such heterogeneous perceptions on the tasks just ascertained our assumption in designing the tasks that task 3 and 4 take higher involvement loads than task 1 and 2.

It is found through the questionnaires that students from group 1 and 2 thought that the reading materials were not different, while students from group 3 and 4 took the opposite view by arguing for the difficulty in the reading materials. This is a interesting result since the post-survey showed that the reading materials were easy to understand by these students. It may be inferred here that the perceptions of students on the difficulty of tasks are transferred to their judging reading materials. As a pedagogical implication, the reading comprehension tasks should be properly designed so that the difficulty in the tasks may be transferred to the reading materials in students’ perception which may impede their conduct of comprehension tasks.

Cross-Modality Has Certain Effects on Vocabulary Learning

Most of students from the interview (two out of three) mentioned that reading while listening could promote their reading and help them understand the text better, although they didn't mention how. It is interesting to have observed that the scores from task 3 and 4 have no significant differences in our experiment, leading to the conclusion that cross-modality exerted little effect on students' learning these target words. However, their perceptions were in contrast to this conclusion. Such contrast between perception and practice still warrants further study. But considering the crucial role of belief in language learning, as interpreted by Kuntz (1996), preconceived beliefs may directly influence or even determine a learner's attitude or motivation, and precondition the learner's success or lack of success. We may argue that the cross-modality (reading while learning) would make certain effects on vocabulary learning if the research or learning process is prolonged.

Learners Should Use Vocabulary in Their Daily Life

Most of the interviewed students regarded the use of words in daily life as the most effective way of learning vocabulary. They advocated the acquisition of vocabulary in multiple ways such as through reading novels, listening music, watching films and etc. For most of the students, interest is a key in selecting the specific ways of learning vocabularies. For example, those who are fond of listening to music can learn the vocabulary while appreciating music, which creates a relaxing or low-anxiety learning ambience that is beneficial to language learning.

Conclusion

In this study, we attempt to test the effectiveness of the ILH with Thai first-year university students as participants. Besides, the effect of cross-modality is considered in the task design for listening plus reading tasks are found to be effective in vocabulary learning on the report of previous study. Four groups of students are assigned with four distinct tasks with ascending involvement load indices set in ILH. The results partially confirm the assumptions in ILH, while the cross-modality show no effects on their vocabulary learning in the present study. On the other hand, data collected from the post-interview show that these students hold positive attitudes towards the effectiveness of cross-modality; their perceptions on the difficulty of these tasks further ascertain the validity of involvement load design in these tasks.

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