The Effects of Input Enhancement on Incidental Academic Word Learning

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ABSTRACT

Reading contributes to vocabulary development and is regarded as an efficient pedagogical approach to vocabulary learning. Through reading, learners are exposed to new words in their rightful context of use. This study investigates the effects of input enhancements on incidental academic word learning through reading English academic texts among English as a Second Language (ESL) undergraduates. The study compares different input conditions, gloss, contextual clue and no clue. Twelve academic words from Coxhead's Academic Word List (AWL) were selected as the target words for this study. Three vocabulary tests were employed to assess academic words learnt incidentally from the texts in terms of their form, meaning recognition and ability to recall. Seventy-nine proficient and less proficient Malaysian ESL undergraduates participated in this study. Findings revealed that proficient participants recognised more target words compared to less proficient participants. In addition, gloss increases the noticeability of the target words, at least at the form recognition level. The study's findings suggest that input enhancement would better impact vocabulary learning if integrated into a reading task or facilitated by vocabulary learning instruction.

Keywords: Academic word, academic word learning, gloss, incidental vocabulary learning, input enhancement

INTRODUCTION

Reading academic texts with understanding involves searching for main ideas, general and specific concepts, being critical, underrating the writer's purpose and attitudes, and identifying discourse patterns and markers (Zulu, 2005). On top of that, academic materials often consist of

complex features of academic discourse, text structure, and vocabulary that may affect learners' understanding of complex contents, usually presented in a lengthy and complex language structure. Moreover, the words used in academic texts are usually low-frequency words, as they are not frequently encountered in non-academic texts, such as academic, technical, and subject-related words. Hence, a wide vocabulary knowledge of general and academic words is important to ensure learners comprehend academic reading materials at the university level (Sulaiman et al., 2018).

Nonetheless, English as the second language (ESL) learners may experience a great hurdle in acquiring and storing new words morphologically or phonologically different from their first language (Nation, 2001). In addition, new words containing unfamiliar sounds or letters influence the success of storing words in isolation or clusters (Hulstijn, 2001). All these justify why ESL learners perceive learning new words as one of the most difficult knowledge to master (Kalajahi & Pourshahian, 2012). Consequently, many Malaysian university students have insufficient vocabulary size, far below what is expected of a university student after years of studying English (Asgari & Mustapha, 2012; Yunus et al., 2016).

Learning words solely to acquire new words is time-consuming (Webb & Nation, 2017) and hence inefficient for university students. On the other hand, reading is a significant source for lexical gains as it provides opportunities for readers to encounter new words in a meaningful context. In other words, reading enables learners to acquire more vocabulary than what explicit vocabulary instruction alone can accomplish. Hence, this study proposes incidental academic vocabulary learning through reading academic texts as one of the approaches to expanding learners' academic vocabulary independently. However, despite its potential outcomes, the question remains the same: what are the optimal conditions that could enhance incidental vocabulary learning through reading?

The present study upholds the notion of comprehensible input by Krashen (1985), which asserts that the input needs to be comprehensible for learners to acquire the meaning and later the structure of the language, which will lead to its acquisition. Input enhancement approaches such as glossing and contextual cues can increase the saliency and comprehensibility of the target words so that they will be noticed and are more likely to be acquired by learners (Smith, 1993). In line with the noticing hypothesis by Schmidt (1990), noticing the input facilitates the conversion of input into the intake; that is when the learner notices the input (namely the target word), only then will the process of word acquisition take place successfully. In the context of incidental learning, the acquisition of new words happens and is considered effective when a task requires learners to pay attention to the relevant features of the input.

Numerous studies have investigated a number of pedagogical approaches to explore L2 incidental word acquisition through L2 reading (Jung, 2016). However,

what is lacking to date is the investigation of multiple factors which combine input and individual differences factors to uncover the most effective way for learners to learn new L2 words. Given this background, this study was conducted to investigate incidental academic word learning through reading English academic texts among proficient and less proficient ESL undergraduates at one of the research universities in Malaysia. Specifically, the study aimed to investigate the effects of glosses and contextual cues as two forms of input enhancements on the learning of selected academic words through reading English academic texts.

Incidental Vocabulary Learning

Past studies of L1 and L2 vocabulary acquisition have found that most vocabulary items are acquired incidentally as the product of learners' engagement in listening, reading, speaking or writing activities (Nagy et al., 1985; Nation, 2001; Schmitt, 2000). According to Richards and Schmidt (2002), learners may acquire words unintentionally while engaging in reading or listening activities specifically aimed at comprehension. This 'unintentional learning' is referred to incidental learning, i.e., the process of learning one thing while intending to learn another. It happens when new words gradually become familiar and known to learners as the words repeatedly appear in the reading or listening activities.

When encountering new lexical items while reading, readers must decide whether to attend to the new lexical forms and their meanings, integrate the new linguistic information into their developing L2 system or ignore the new words. According to Pulido (2007), the new words that readers encounter may be processed at a superficial level (that is, at the recognition level), reducing the likelihood of the words being retrieved from memory later. Alternatively, these new words will be noticed by readers, and sufficient attention will be allocated to the new words. The meaningful attention allocated in the lexical processing during reading is important for incidental vocabulary learning in this modality.

Huckin and Coady (1999) have listed the benefits of incidental vocabulary learning in the context of incidental learning. Firstly, the vocabulary encounter is in its context of use which gives learners not just the meaning of the word but also information on its knowledge of use. Secondly, incidental vocabulary learning can be pedagogically efficient as reading and vocabulary learning occur concurrently. Finally, according to Huckin and Coady, incidental vocabulary learning is more individualised than intentional vocabulary learning as in learning in a language classroom because vocabulary learned depends on the learners' needs and conscious effort. Through incidental learning, a broader amount of vocabulary can be exposed to learners in its context (Nation & Waring, 2013), and learners will at least learn the partial meaning of the words they encounter (Ponniah, 2011) or may remember the first few letters of the word, or its broad structural outline (Schmitt, 2010) which may lead to the acquisition of the word. Furthermore, the words learned

via incidental learning are claimed to result in better retention and recall as it involves deeper cognitive processing (Ahmad, 2012; Kweon & Kim, 2008).

Input Enhancement

Smith (1993) introduced the term 'input enhancement,' an approach that intentionally drives an input to be noticeable by learners, for example, by highlighting (e.g., bolding, underlining) or glossing certain parts of the structure of words in the texts that need to be attended to. The key point is to make the input more salient to learners and enhance the chances of the input being noticed. However, input enhancement does not assure the learners' attention to the input nor guarantees the retention of the input. Among the methods of input enhancement that input modification is visual input enhancement, semantic input enhancement, and input flooding. Visual input enhancement is also known as typographical or textual (written input) enhancement. Visual input enhancement accentuates targeted components of the input to implicitly make it prominent to the learners (Namaziandost et al., 2020). For example, the saliency of the target word can be increased using different colours, italics, underlining, boldface, and others. Semantic input enhancement involves providing semantic characteristics of the target word and augmenting attention to the target word to enhance retention and improve recognition (Zarei et al., 2016). Examples of semantic enhancement are glosses containing the meaning of target words in L1 or L2 and the contextual information included in the text to assist learners in acquiring the target word. Input flooding focuses on the form of intervention in which the input is repeatedly exposed to learners (Hernández, 2018). It allows learners to get ample exposure to the target form of the input and increase the possibility for learners to acquire the form.

The concept of input enhancement is integrated into the present study to investigate the effect of input enhancement on incidental word learning. The use of gloss helps to enhance the chances of the input being noticed (Jung, 2016). When reading academic material in L2 is concerned, modification of input surrounding target words will increase the chance of L2 learners to acquire the words incidentally.

A considerable number of past studies have shown that overall gloss has a positive effect on vocabulary learning compared to the no gloss condition (Danesh & Farvardin, 2016; Duan, 2018; Jung, 2016; Ko, 2012; Watanabe, 1997). However, the contradicting notion is that gloss might deprive a learner's mental effort for searching and inferring the meaning of the word, causing a less affirmative result in vocabulary learning (Huang & Lin, 2014). The use of gloss is beneficial as it may compensate for the lack of contextual input; however, this may diminish the reader's chance to infer and hence reduce the effort in the processing of the new word, which might affect the retention of the new word in their long-term memory (Watanabe, 1997). On the other continuum, new words could effectively and efficiently be learnt by making learners infer the meaning of unknown words

using the information obtained from context (Hulstijn, 1992). However, Zahar et al. (2001), in their study on the effects of frequency and contextual richness on L2 vocabulary learning through reading, found no relationship between vocabulary gained and the types of contexts in which they were presented. Nevertheless, adequate and familiar contextual information surrounding the target words opens a learning opportunity for learners to understand the target word and the context better. Nonetheless, the number of studies that examined the learning of specific target words based on corpus or wordlist in a specific context is quite limited. Thus, examining how ESL university students learn academic words through incidental learning while reading English academic texts would contribute to better insights into this area.

Academic Words

Academic word is a specialised vocabulary of academic texts. There has been a growing body of research investigating what words are needed for academic study and how vocabulary should be taught and practised in the academic context at a tertiary level of education. Academic vocabulary is postulated as words that are relevant to a university setting and are most likely to be encountered by learners in their reading (Coxhead & Byrd, 2007). It is a set of lexical items frequently utilised in academic texts such as journal articles, theses/dissertations, research papers, conference papers, and academic books. Hence, academic vocabulary is vital for comprehension and communication among university students. The limitation of academic vocabulary in learners' mental lexicon may restrict their 'comprehension to grasp the academic concepts they are learning.

Sulaiman et al. (2018), who conducted a study on Malaysian ESL undergraduates' knowledge of academic words based on the Academic Word List (Coxhead, 2000), found that learners' knowledge of academic words was still low and that the distribution of the knowledge of these words differs according to their academic disciplines and English language proficiency. Their findings, however, reveal the need for further investigations on learning academic words among university students and seek alternative ways to provide adequate based on their vocabulary needs. Given this background, input enhancements are one of the alternatives for learners to acquire vocabulary, which is imperative for their academic endeavour.

METHODOLOGY

Participants

The current study participants were 79 ESL first-year undergraduates pursuing two different academic specialisations in the social science field at one of the research universities in Malaysia. The participants were those who had not taken any preparatory courses related to English for Academic Purpose (EAP). Consequently, they were not formally taught the structure, types, and language skills associated with academic discourses. Hence, it was assumed that the likelihood of knowing the selected

academic words from AWL was low. The participants were grouped according to their English language proficiencies. The categorisation of proficient and less proficient groups was based on the participants' Malaysian University English Test (MUET), a standardised Malaysian English language proficiency test at the post-secondary level administered by the Malaysian Examination Council. A total of 41 participants fell under the proficient group, while 38 were in the less proficient group.

Target Words

Twelve academic words derived from Coxhead's (2000) Academic Word List (AWL) were selected as the target words for this study. The academic word list (AWL) compiled by Coxhead (2000) is widely used in language teaching and testing, as well as in the development of pedagogical material. Coxhead's AWL is derived from a large corpus of academic texts such as journal articles, university-level textbooks, book chapters and laboratory manuals from 28 subject areas in four disciplines: arts, commerce, law, and science. The list consists of 570-word families and includes all related forms such as affixes, inflected forms, and transparent derivational forms. Coxhead's AWL is categorised into ten sub-lists based on word frequency and range. The most frequent words are included in the first sub-list, whereas the least frequent words are included in the tenth sub-list.

Target words are among the low-frequency words on the AWL list and listed among the highest percentages of reported "unknown" words by the respondents in the study conducted by Sulaiman et al. (2018). The target words were inserted into the three texts and enclosed with three different conditions: gloss, contextual clue, or no clue. The target words were not equally distributed across the three texts since they were inserted according to the suitability of the sentence and content. In this study, glosses in the form of definitions of the target words appeared on the right-side margin of the text. Each gloss was placed in a blue-outlined box, in line with the target word in the text. The number of words in the gloss box was between four and six. Table 1 shows the list of target words and their input conditions.

Table 1
List of target words and their input conditions

Academic word	Sub list	Input condition
Albeit	10	Gloss
Amend	5	Gloss
Notion	5	Gloss
Confer	4	Gloss
Integral	9	Contextual Clue
Derive	1	Contextual Clue
Constrain	3	Contextual Clue
Diverse	6	Contextual Clue
Inevitable	8	No Clue
Orient	5	No Clue
Adequate	4	No Clue
Nonetheless	10	No Clue

Reading Texts

The three reading texts (labelled as Text A, Text B and Text C) were adapted from the introduction section of three journal articles. The introduction part of an article is deemed

suitable to use as the reading material for this study as it provides relevant information about the topic and usually does not contain any methodological terms that may be unfamiliar to the participants. In addition, the length of the texts was 1217 words, and its readability was suitable for college-level entry students (aged between 21-22 years old), as measured by the Flesch-Kincaid readability scale.

Vocabulary Tests

Three tests were administered to the participants to assess the form-meaning link of target words learned by participants, namely form recognition, meaning recall, and form and meaning recognition tests. The first test (Test 1) was a form recognition test, in which the participants were asked to circle the words they remembered seeing in the text they read. The test was meant to assess the participants' ability to recognise the form of the target words encountered during reading. It was followed by the meaning recall test (Test 2), in which the participants were required to provide the meaning of the twelve target words without contextual support. The purpose of the second test is to measure the participants' comprehension of the meaning of the target words in a decontextualized manner. The last test (Test 3) required the participants to choose the right target words that fit the sentence in cloze test format. This test could indicate the participants' understanding of the meaning of the study's target words in their context of use. The use of multiple measures of vocabulary enables the researcher to

measure the different types of knowledge learned and the strength of that knowledge (i.e., the depth of vocabulary and how well the participants know the word; Nation & Webb, 2011). The tests were given after the participant had completed the reading session. The participants were aware of the tests but were not informed in detail about the content of the tests. It was done to create an ideal experimental condition for incidental vocabulary acquisition, that is, by directing students' attention and purpose towards understanding the text rather than individual words (Hulstijn et al., 1996). There was no time limit allocated for each test.

FINDINGS

The target academic words were analysed individually based on their input conditions (gloss/contextual clue/no clue) to examine their effect on academic word learning. In addition, the comparisons between the mean vocabulary scores of target words with different input conditions were made between the two groups of participants respectively to scrutinise the effect of input conditions on vocabulary gains. The differences in mean scores for the three vocabulary tests based on input conditions which are gloss, contextual clue, and no clue, are presented according to participants' English language proficiency in the following sections.

Vocabulary Tests Scores

In this study, learning the target words was operationalised as the participants' ability to

recognise and give accurate meaning to the target words in three vocabulary tests. The scoring for each vocabulary test was based on the number of correct answers given for each test. In other words, participants being able to answer correctly in a vocabulary test means they can either recognise form or recall form and meaning in the test. Table 2 shows the descriptive analysis of proficient participants' scores in each test according to the target academic words. Of 41 proficient participants, 38 recognised the word 'albeit' presented in Test 1. The words 'diverse' and 'notion' were also highly recognised by the most proficient participants. On the other end, 'orient' was the least recognised by proficient participants. Only nine out of forty-one proficient participants remembered seeing the word 'orient' and could recognise it after they had read the texts.

In addition, more than half (50% to 88%) of the proficient participants recognised eleven out of twelve target words. However, successful recognition of the form of the word did not guarantee that the participant would be able to recall the meaning of the word. The percentages of participants who correctly gave meaning to the target words on Test 2 decreased compared to those who managed to recognise the target words. It reflects that some of the participants who successfully recognised the form of the target words failed to recall the meaning of the target words. For example, only three participants could provide the meaning of the word 'integral' (i.e., scored in Test 2) even though 22 participants were initially able to recognise the word (scored in Test 1).

There are many factors affecting word recognition and meaning recall. Presumably, some of the participants had already known the target word prior to the reading of the texts. However, they did not remember seeing the word in the texts. In this case, they were probably not focused on the words while reading, as the words were already familiar to them. Therefore, they could score in Tests 2 and 3, but not on

Table 2

Frequency and percentage of proficient participants scored in each test

Target Word	Test 1	Test 2	Test 3
Albeit	36 (87.8%)	20 (48.8%)	22 (53.6%)
Confer	27 (65.8%)	7 (17.1%)	21 (51.2%)
Integral	22 (53.6%)	3 (7.3%)	6 (14.6%)
Inevitable	28 (68.3%)	13 (31.7%)	25 (60.9%)
Derive	23 (56.1%)	14 (34.1%)	23 (56.1%)
Diverse	33 (80.5%)	26 (63.4%)	24 (58.5%)
Notion	32 (78.0%)	11 (26.8%)	22 (53.6%)
Orient	9 (21.9%)	11 (26.8%)	17 (41.5%)
Nonetheless	29 (70.7%)	29 (70.7%)	27 (65.8%)
Adequate	33 (80.5%)	13 (31.7%)	18 (43.9%)
Amend	30 (73.1%)	14 (34.1%)	24 (58.5%)
Constrain	24 (58.5%)	19 (46.3%)	28 (68.3%)

Test 1. For example, the word 'orient' was reported to be recognised by nine proficient participants. However, eleven proficient participants accurately recalled the meaning of the word 'orient' (as reflected in Test 2), and seventeen proficient participants managed to use the word correctly (as reflected in Test 3).

For ten target words: 'albeit,' 'confer,' 'integral,' 'inevitable,' 'derive,' 'notion,' 'orient,' 'adequate,' 'amend,' and 'constrain,' the results showed that proficient participants scored higher in Test 3 compared to Test 2. It indicates that these participants could recognise the form and meaning of the target words when they were presented in context but failed to recall the meaning of the words in a decontextualized manner.

Table 3 shows the descriptive analysis of vocabulary scores in each test among the less proficient participants according to target academic words. Eight target words: 'amend,' 'adequate,' 'nonetheless,' 'notion,' 'diverse,' 'derive,' 'inevitable,' and 'albeit'

were recognised by more than half of the less proficient participants. Similar to the proficient group, the word 'albeit' was the most recognised target word among the less proficient participants, while the word 'orient' was the least recognised by the less proficient participants. It indicates that the word 'albeit' was perceived as a low frequency or unfamiliar word as only a few participants from both groups were able to recognise it.

Compared to Test 1, a smaller number of less proficient participants had successfully scored in Test 2. In other words, even though the less proficient participants remembered seeing the target words while reading the texts, most may not understand the meaning, which was reflected by the low scores in Test 2. Five target words, namely 'albeit,' 'confer,' 'inevitable,' 'notion,' and 'constrain,' showed that a higher number of less proficient participants scored in Test 3 compared to Test 2. It indicates that the participants could recognise the form

Table 3

Frequency and percentage of less proficient participants scored in each test

Target Word	Test 1	Test 2	Test 3
Albeit	32 (84.2%)	12 (31.5%)	18 (47.4%)
Confer	15 (39.5%)	6 (15.8%)	18 (47.4%)
Integral	14 (36.8%)	3 (7.9%)	3 (7.9%)
Inevitable	20 (52.6%)	4 (10.5%)	12 (31.5%)
Derive	22 (57.9%)	9 (23.7%)	9 (23.5%)
Diverse	23 (60.5%)	13 (31.6%)	13 (31.6%)
Notion	24 (63.1%)	4 (10.5%)	8 (21.0%)
Orient	11 (28.9%)	9 (23.7%)	6 (15.8%)
Nonetheless	21 (55.3%)	21 (55.3%)	20 (52.6%)
Adequate	27 (71.0%)	7 (18.4%)	6 (15.8%)
Amend	21 (55.3%)	10 (26.3%)	9 (23.7%)
Constrain	15 (39.5%)	8 (21.0%)	14 (36.8)

and meaning of those target words when presented in context but failed to recall the meaning when the words were presented in isolation.

Overall, participants from the proficient group recognised more target words, as seen in Test 1, compared to the less proficient participants. However, in both groups, the number of participants who scored in Test 2 was smaller compared to those who successfully scored on Test 1 for almost all target words. In other words, more participants in both groups failed to provide the meaning of the target words even though they remembered seeing the words while reading the texts. In Test 3, the more proficient participants could recognise the form and meaning of more target words compared to the less proficient participants. These participants displayed their understanding of the target words by successfully choosing the right target word that suited the context of the sentence.

Table 4 displays the summary of the total mean scores of each test for both groups of participants. Again, the proficient group of participants exhibited a higher mean score compared to the less proficient group for all the vocabulary tests.

A t-test was performed to determine the significant difference between the two groups' vocabulary scores on the three tests. The dependent variable was the mean scores for each vocabulary test, and the independent variable was participants' English language proficiency (categorised as proficient and less proficient). Based on the analysis presented in Table 5, there was a significant difference between proficient and less proficient participants in each vocabulary tests; Test 1 ($t(77) = 3.163$, p $0.002 < 0.01$), Test 2 ($t(77) = 2.622$, p $0.011 < 0.05$) and Test 3 ($t(77) = 4.573$, p $0.000 < 0.001$). These results suggest that language proficiency influenced vocabulary test performances. Specifically, the results indicated that more proficient participants could recognise and recall more target words compared to the less proficient participants.

Table 5
Differences in each vocabulary test score between proficient and less proficient

Test	T	Df.	Sig. (2-tailed)
Test 1	3.163	77	0.002**
Test 2	2.622	77	0.011*
Test 3	4.573	77	0.000***

*Significant difference at $p < .05$
** Significant difference at $p < .01$
*** Significant difference at $p < .001$

Table 4
Summary of total mean scores of each test

Test	Group	N	Mean	Standard Deviation
Test 1	Proficient	41	8.02	2.38
	Less Proficient	38	6.31	2.41
Test 2	Proficient	41	4.43	2.91
	Less Proficient	38	2.92	2.13
Test 3	Proficient	41	6.26	2.61
	Less Proficient	38	3.63	2.49

Mean Scores of Three Vocabulary Tests Based on Input Conditions for Proficient ESL Undergraduates. To investigate the significant difference in the mean total scores of each test between input conditions, a one-way analysis of variance (ANOVA) test was performed. The dependent variable was the mean scores of the target words according to their input enhancements, and the independent variable was participants' vocabulary scores in three tests, namely Test 1, Test 2, and Test 3. As can be seen in Table 6, the results of ANOVA indicated that there was a significant difference among the three conditions namely gloss (F = 25.261, p 0.000< 0.001), contextual clue (F = 8.161, p 0.000< 0.001), and no clue (F = 4.706, p 0.011 < 0.05) between the mean scores of three vocabulary tests.

Post-hoc Tukey HSD test was performed to determine the significant difference among the three tests for each input condition (Table 7). For the gloss condition target word score among the proficient participants, post hoc comparisons using the Tukey HSD test indicated that the mean score for vocabulary Test 1 (M= 3.17, SD=0.99) was significantly different from the mean scores for Test 2 (M=1.60, SD=0.91) and Test 3 (M=2.26, SD=1.07). For the contextual clue condition, results showed that the mean score for Test 1 (M=2.51, SD=1.02) was significantly different from the mean score for Test 2 (M=1.65, SD=0.88). However, the mean scores for Tests 1 and 3 and Tests 2 and 3 were not significantly different. The outcome was similar to the contextual condition for the no clue condition. The

Table 6
ANOVA test for input conditions and vocabulary tests scores (proficient group)

Input Condition	Sum of Squares	df	Mean Square	F	Sig.
Gloss	50.358	2	25.179	25.261	0.000***
Contextual Clue	15.041	2	7.520	8.161	0.000***
No Clue	8.537	2	4.268	4.706	0.011*

*Significant difference at p <.05
** Significant difference at p < .01
*** Significant difference at p < .001

Table 7
Tukey HSD test for input condition (proficient group)

Dependent Variable	(I)Test	Mean	SD	(J) Test	Mean Difference (I-J)	Standard Error	Sig.
Gloss	Test 1	3.17	0.99	Test 2	1.560	0.220	0.000***
				Test 3	0.902	0.220	0.000***
	Test 2	1.60	0.91	Test 1	-1.560	0.220	0.000***
				Test 3	-0.658	0.220	0.010*
	Test 3	2.26	1.07	Test 1	-0.902	0.220	0.000***
				Test 2	0.658	0.220	0.010*

Table 7 *(continue)*

Dependent Variable	(I)Test	Mean	SD	(J) Test	Mean Difference (I-J)	Standard Error	Sig.
Contextual Clue	Test 1	2.51	1.02	Test 2	0.853	0.212	0.000***
				Test 3	0.365	0.212	0.261
	Test 2	1.65	0.88	Test 1	-0.853	0.212	0.000***
				Test 3	-0.487	0.212	0.069
	Test 3	2.14	0.96	Test 1	-0.365	0.212	0.261
				Test 2	0.487	0.212	0.069
No Clue	Test 1	2.39	0.86	Test 2	0.609	0.210	0.013*
				Test 3	0.121	0.210	1.000
	Test 2	1.78	1.01	Test 1	-0.609	0.210	0.013*
				Test 3	-0.487	0.210	0.066
	Test 3	2.26	0.93	Test 1	-0.121	0.210	1.000
				Test 2	0.487	0.210	0.066

*The mean difference is significant at the 0.05 level
**The mean difference is significant at the 0.01 level
***The mean difference is significant at the 0.001 level

mean score for Test 1 (M=2.39, SD=0.86) and Test 2 (M= 1.78, SD= 1.01) for the no clue condition was significantly different, while the mean score for Test 1 and Test 3, and Test 2 and Test 3 was not significantly different.

Mean Scores of Three Vocabulary Tests Based on Input Conditions for Less Proficient ESL Undergraduates. Table 8 revealed a significant difference for all three input conditions namely, Gloss (F = 17.237, *p* 0.000 < 0.001), Contextual Clue (F = 9.673, *p* 0.000 < 0.001), No Clue (F = 9.375, *p* 0.000 < 0.001) based on the three vocabulary tests.

As seen in Table 9, the mean scores between Test 1(M=2.42, SD= 1.10) and Test 2 (M=1.31, SD=, 0.52), Test 1 and Test 3 (M=1.55, SD= 0.86) for glossed target word showed a significant difference. However, the mean scores between Test 2 and Test

3 revealed otherwise. For contextual clue condition, the mean scores between Test 1 (M=2.10, SD=0.98) and Test 2 (M=1.36, SD=1.36, SD=0.67), and Test 1 and Test 3 (M= 1.42, SD= 0.68) showed a significant difference, whereas the mean scores between Test 2 and Test 3 did not significantly differ. Lastly for no clue condition, there was a significant difference between the mean scores of Test 1 (M= 2.10, SD= 0.86) and Test 2 (M= 1.39, SD= 0.63), and the mean score of Test 1 and Test 3 (M= 1.50, SD= 0.79). However, there was no significant difference between the mean scores of Test 2 and Test 3 for target words in no clue condition.

DISCUSSION

The current study's findings reveal that the proficient participants recognised and successfully recalled the meaning of more

Table 8
ANOVA for input conditions and vocabulary tests scores (less proficient)

Input Conditions	Sum of Squares	df	Mean Square	F	Sig.
Gloss	25.737	2	12.868	17.237	0.000***
Contextual Clue	12.842	2	6.421	9.673	0.000***
No Clue	11.175	2	5.588	9.375	0.000***

*Significant difference at $p < .05$
** Significant difference at $p < .01$
*** Significant difference at $p < .001$

Table 9
Tukey HSD test for input condition (less proficient group)

Dependent Variable	(I) Test	Mean	SD	(J) Test	Mean Difference (I-J)	Standard Error	Sig.
Gloss	Test 1	2.42	1.10	Test 2	1.105	0.198	0.000***
				Test 3	0.868	0.198	0.000***
	Test 2	1.31	0.52	Test 1	-1.105	0.198	0.000***
				Test 3	-0.236	0.198	0.704
	Test 3	1.55	0.86	Test 1	-0.868	0.198	0.000***
				Test 2	0.236	0.198	0.704
Contextual Clue	Test 1	2.10	1.03	Test 2	0.736	0.186	0.000***
				Test 3	0.684	0.186	0.001**
	Test 2	1.36	0.67	Test 1	-0.736	0.186	0.000***
				Test 3	-0.052	0.186	1.000
	Test 3	1.42	0.68	Test 1	-0.684	0.186	0.001**
				Test 2	0.052	0.186	1.000
No Clue	Test 1	2.10	0.86	Test 2	0.710	0.177	0.000***
				Test 3	0.605	0.177	0.003**
	Test 2	1.39	0.63	Test 1	-0.710	0.177	0.000*
				Test 3	-0.105	0.177	1.000
	Test 3	1.50	0.79	Test 1	-0.605	0.177	0.003**
				Test 2	0.105	0.177	1.000

*The mean difference is significant at the 0.05 level
**The mean difference is significant at the 0.01 level
***The mean difference is significant at the 0.001 level

target words compared to the less proficient participants. It suggests that language proficiency does influence vocabulary test performance. The findings are consistent with past studies by Warren et al. (2018) and Duan (2018), who found that highly proficient participants demonstrated better at both form and meaning recall of target words. It is the least puzzling as the past study by Sulaiman et al. (2018) revealed that ESL Malaysian undergraduates with low proficiency in the English language had

lower AWL knowledge compared to high proficiency undergraduates. It indicates that more proficient undergraduates are more likely to be more familiar with the target words used in this study and are aware of them as they read the texts.

Proficient and less proficient participants highly recognised target words in the gloss condition, yet they were still unable to recall the meaning of the words. Glosses reduce the processing time to search for the target word's meaning, which diminishes the possibility of incorrect meaning inferencing target words by participants. The salient feature of gloss that provides the meaning of target words directly enhances the chances of the target words in the gloss condition being noticed and retained at the form recognition level. However, many participants from both groups were unable to recall the meaning of the glossed target words. It reflects that the participants did not fully use the benefit of gloss in their reading. They dismissed the chances for deeper processing of target words while reading and understanding the text. Hence, it reduces the retention of meaning recall of glossed target words as resonated in the participants' low-performance scores in the meaning recall test.

Overall, gloss appears to promote better vocabulary gain, especially on form recognition, regardless of the participants' language proficiency. It is consistent with findings from past studies (e.g., Danesh & Farvardin, 2016; Duan, 2018; Jung, 2016; Ko, 2012; Watanabe, 1997), which showed that glossing has a positive impact on L2 vocabulary learning. Surprisingly, target words in the contextual clue and no clue conditions were retained better in the meaning recall, even though they were less recognised compared to target words in the gloss condition. Contextual clue provides information on the target word's meaning in its rightful context of use. A richer informative context may yield better gains in knowledge of the meaning of target words (Webb, 2008). In line with the findings of this study, the contextual clue condition may provide better context information for the target words, which makes participants put more cognitive effort into acquiring the meaning of the target words as compared to the gloss condition. In addition, the no clue condition induces the participants' effort to infer the meaning of the target words based on their lexical knowledge, which may require higher cognitive effort and result in better recall of the target words (Hulstijn, 1992). Proficient participants with better word knowledge than less proficient participants showed higher mean scores for the no clue conditions for both meaning recall (Test 2) and form and meaning recognition (Test 3) tests.

Proficient participants recognise more words in contextual conditions than less proficient participants. As a result, the proficient participants have better L2 vocabulary knowledge; they are more likely to know a wider range of L2 word knowledge, which leads to a better comprehension of L2 texts. Therefore, it can be assumed that proficient participants are better at utilising contextual clues provided and inferring the

meaning of unknown words compared to less proficient participants (Zahar et al., 2001).

Overall, the results of the present study conclude that explicitness meaning inferences of target words during reading does not guarantee vocabulary gains, especially in recalling word meaning ability. In this case, glosses, which provide the explicit meaning of the target words presumed to attract learners' attention while reading, only manage to assist the learner in recognising the form of the target word. Nonetheless, putting more cognitive effort into inferring word meaning from informative or less informative contexts appears to help develop recall word knowledge among participants.

CONCLUSION

The findings of this study add to the growing body of second language vocabulary research, specifically on the development of academic vocabulary. In line with Schmidt's Noticing Hypothesis and Krashen's Comprehensible Input, the study supports the notion that enhanced target words with comprehensible input attract learners' attention which may lead to the successful acquisition of the target words. It, however, depends on the degree of attention placed on the target words as well as the types of input enhancement provided.

The study puts forth the significant role of comprehensible input in providing ample and informative contexts to increase the likelihood of incidental vocabulary learning through reading. However, as projected in the overall results, comprehensible input alone may not be sufficient; hence, input enhancements contribute to maximising the best conditions for targeted words to be noticed and acquired successfully. Furthermore, a combination of multiple-input enhancements could provide an expansion of opportunities for incidental vocabulary learning. For example, multiple exposures to target words coupled with highlighted glossed words could increase the chances of vocabulary acquisition. Therefore, it contributes to the extension of the input enhancement concept to provide comprehensible input for incidental vocabulary learning. The current study also underscores the importance of suitable academic reading materials that entail rich and ample input as a substantial source for academic vocabulary learning. Academic vocabulary mastery is important for all university students regardless of their academic specialisation. Therefore, the study provides a guideline for selecting and designing reading materials to ease reading comprehension and help learners enhance their vocabulary. Specifically, this information is valuable for creating or modifying authentic academic reading materials (i.e., journal articles) for vocabulary learning purposes. These include taking into consideration all input and textual features (i.e., lexical properties, range, and frequency of target words), learner factors (i.e., language proficiency, academic specialisation) in selecting suitable contents and contexts to cater for the needs of ESL university students.

In addition, the findings revealed the provision of different input enhancements to the in-reading material that can be adapted for second language vocabulary learning and teaching. The gloss has been shown to enhance the noticeability of target words, which leads to successful form recognition of the words among participants in the current study regardless of their language proficiency. Using typographic enhancement such as highlighting or bolding the target words in the passage could also increase the chances of deeper processing of the target words among participants. Vocabulary learning in the present study varies depending on the input enhancement of academic target words and the participants' language proficiency. Students should be taught how to read glosses effectively or any input enhancement provided in the texts. Glosses should be read when encountered because they are usually presented on the same line as the target words. Reading the glosses this way would assist learners in understanding the words in context better and eventually ease the reading comprehension of the text. It is important as it enables students to pay deliberate attention to new words in their rightful context, which will further augment the successful acquisition of the words. It also trains students to become autonomous learners and function independently when encountering new lexical items in other contexts. In addition, language educators could expose the use of vocabulary learning strategies to students. It is particularly useful to ensure that learners efficiently utilise all input provided using the right strategies to facilitate their academic vocabulary mastery through incidental learning.

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