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The Integration of Explicit Instruction and Implicit Meaning-Focused Experience for L2 Vocabulary Development: The Comparative Effect of Time Sequence

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Abstract

The combination of implicit meaning-focused input and explicit instruction has been suggested by recent research as very effective for learning L2 vocabulary; however, the time sequence for such juxtaposition has not been adequately examined through empirical studies. Therefore, this study sought to find the optimal time for combining explicit and implicit L2 vocabulary instruction using an explanatory mixed-method design. A convenience sample of 62 upper-intermediate EFL learners from three intact classes participated in this study. The Test of Academic Word List (Version A) that assesses Coxhead's (2000) Academic Word List (AWL) was administered as a pretest. The reading book, *Focus on Vocabulary 2*, that has been developed based on the AWL was used for giving meaning-focused input. The target words were explicitly pre-taught in Class A (n=22), taught concurrent with encountering them in the reading text in Class B (n=20), and post-taught in Class C (n=22). Version B of the AWL Test was used as the posttest and after a 14-day retention interval (RI) as the delayed posttest. Then, 25% of the learners were orally interviewed about their attitudes toward the treatment they received. Quantitative data analysis using one-way ANCOVA revealed that explicit teaching during the reading was the optimal time and could help learners significantly do better on the immediate and delayed post-tests followed by pre-teaching. Qualitative analysis also verified

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the obtained quantitative results. The findings of this study imply that explicit vocabulary teaching during the reading should be practiced by EFL teachers/learners for fostering vocabulary development.

Keywords: Explicit teaching, Implicit teaching, Vocabulary development, Vocabulary retention, Meaning-focused experience

Possessing an adequate depth and breadth of vocabulary has always been a central competency and a lingering concern in acquiring a foreign or second language (L2). As Alderson (2005) appropriately pointed out, L2 capability “is to a large extent a function of vocabulary size” (p. 88). Because of its essential centrality in the structure of all the main language skills, González Fernández and Schmitt (2017) considered L2 vocabulary as the most ubiquitous language ingredient. As cited by Nation (2008), during the past century, teaching vocabulary to L2 learners has witnessed many twists and turns and different theoretical perspectives have employed different pedagogical practices in this regard.

The well-known dichotomy between direct or implicit vs. indirect or implicit teaching of vocabulary is one of these widely discussed stances in the exiting literature (Nation, 2010). According to Schmitt (2014), no unanimous consensus has been agreed about the combination, sequence, or effectiveness of the two aforementioned standpoints among the experts. Explicit vocabulary teaching means to acquire L2 words by focusing on them through various types of activities. In other words, when L2 learners’ purpose is to learn lexical knowledge rather than other kinds of input, vocabulary is said to be taught explicitly (Thornbury, 2015); however, indirect or implicit vocabulary learning occurs when L2 learner has focused on reading, listening or other language skills and the words are acquired peripherally (Takač, 2008).

The implicit learning was purposefully used instead of the term ‘incidental’ because according to vocabulary specialists the latter means learning lexical knowledge without a conscious intention to learn (Hulstijn, 2001), in the absence of any formal or informal assessment (Nation, 2001), and through extensive self-reading, listening, or watching (Stæhr, 2008) when the purpose of receiving input is not the language itself

but the content (Schmitt, 2010). Based on this view, as argued by Arndt and Woore (2018), both direct (explicit) and indirect (implicit) vocabulary instructions are intentional. For this reason, incidental learning has also been described as a by-product of communicative language tasks (Hulstijn, 2001) in the real world interactions through the use of the target L2.

A meticulous walkthrough of the vocabulary studies from 1990s to 2018 reveals that most studies have supported a more superior effect for direct or explicit instruction (e.g. Hennebry, et al., 2017; Laufer, 2006; Schmitt, 2008; Sonbul & Schmitt, 2009) whereas another group of studies advocates the more efficient role of indirect or implicit instruction (e.g. Alcón, 2007; Hulstijn, 2001; Pellicer-Sanchez, & Schmitt, 2010; Vidal, 2011; Webb, 2008) for L2 vocabulary development and retention. However, as suggested by van Zeeland and Schmitt (2013), it seems the two perspectives should not be separated rather they can be considered as complementary and none of them can be excluded at the expense of the other.

Laufer (2017) also appropriately argued for a balanced combination of explicit and implicit vocabulary teaching that has been mostly materialized through meaning-focused input, namely intensive vs. extensive reading or listening. Moreover, according to Laufer (2017), since L2 learners need to encounter target words about at least ten to twenty times in extensive reading or listening which means many oral or/and written passages, acquiring all the needed words only through implicit meaning-focused input is impossible, making the word-focused explicit instruction an indispensable prerequisite. This well-adjusted amalgamation can particularly be considered efficacious for mastering formal academic words as called upon by McCarthy and O'Dell (2016). However, to the best knowledge of the researchers, no outstanding previous study has examined the most propitious time for juxtaposing the two aforementioned instructions together. Put it more simply, finding the optimal time for explicit vocabulary teaching accompanied by meaning-focused experience through reading or listening is a worthwhile but under-researched issue. Accordingly, the present study seeks to examine the

optimal time for explicit instruction of vocabulary before, during, or after the meaning-focused experience (intensive reading) for acquiring and retaining academic core words among Iranian upper-intermediate EFL learners in a principled way.

Literature Review

As aforementioned, a balanced combination of explicit (direct) and implicit (indirect) teaching of L2 vocabulary is the most favorable stance emerged from the long-debated dichotomous explicit-implicit instruction and was embraced by some renowned experts of this domain (e.g. Elgort et al., 2016; Hennebry, et al., 2017; Marulis & Neuman, 2010; Nation, 2008, 2013; Schmitt & McCarthy, 1997; van Zeeland & Schmitt, 2013). Regarding this effective coalescence, Schmitt and McCarthy (1997) held that “we believe we should not be thinking in terms of better/worse or either/or, but rather we should see the two methods as complementary” (p. 3). Marulis and Neuman (2010) asserted that merging explicit and implicit vocabulary instruction can help L2 learners in two ways; first, it provides a learning model for acquiring the words in a meaningful context that, in turn, fosters the mastery of the words beyond a shallow partial learning and secondly, it provides meaningful contextualized practice that facilitates far rigorous internalization and retention.

According to Schmitt (2008), compelling new evidence supports the inclusion of both explicit and explicit vocabulary lexical instruction because while implicit meaning-focused and incidental exposure enhance L2 learners’ breadth of vocabulary, explicit teaching bolsters their depth of vocabulary knowledge. The efficiency of such complementary composite is deemed to be theoretically supported as well. For example, according to the lexical quality hypothesis (Perfetti & Hart, 2000; Perfetti, 2007), the richer the quality of the clues for vocabulary development the deeper the internalization of the target words. Perfetti (2007) contends that high-lexical qualities such as authentic contextualization, orthographical practices, various meaning manipulations, ample input- and output-based exercises set the stage for exponentially effective learning and precipitate

future meaning retrieval. Schmitt (2014) holds that a balanced mixture of the explicit and implicit approaches maximizes the high-lexical capacities suggested by lexical quality hypothesis than other conditions where solely one of the two above-mentioned instructional trends. The efficiency of mixing explicit and implicit instruction on learning L2 vocabulary is also supported by instance-based framework of word learning (Bolger et al., 2008; Reichle & Perfetti, 2003) based on which the initial learning of a target word that is achieved in the first encounter established important episodic traces that are reinforced by later encounters with the word in other texts.

This view is increasingly getting more momentum from both theory and research and as Hennebry, et al. (2017) highlighted, incorporating explicit vocabulary-teaching strategies into the orthodox implicit meaning-focused instruction not only provokes better vocabulary learning but also broadens our theoretical understanding of the underlying cognitive and psycholinguistic processes inherent to vocabulary acquisition. According to Laufer (2017), learning vocabulary-through-input approach is not adequately effective per se rather it needs to be complemented by explicit word-focused instruction to assist L2 learners to deal with the daunting task of vocabulary learning. Nation (2015) also commented that the enormity of the breadth and depth of L2 vocabulary is a tremendous task face by language learners that cannot be overcome through either extensive reading/listening or intensive direct instruction; rather, we should provide the learners with a well-adjusted combination of the two trends to achieve effectual receptive and productive vocabulary development. However, one overarching question remains untouched: how should we juxtapose the two and why?

Although there has been a wide consensus among the SLA scholars (e.g. Alderson, 2005; Ellis, 2009, 2015; Mitchell & Myles, 2004) and L2 vocabulary experts (Laufer & Hulstijn's, 2001; Laufer, 2006; Nation, 2008, 2013, 2015; Schmitt, 2009, 2014) about the advantages and productivity of the joint explicit and implicit vocabulary instruction and its priority over using just one of these two methods, this stance has solely

remained in the realm of theoretical speculations. A review of the existing literature on this issue indicates that comparatively, little empirical research has been conducted on the most fruitful and efficacious sequence for integrating explicit vocabulary teaching with the meaning-focused implicit experience, i.e. reading, listening and watching as well. Only a few studies have sought to investigate the time factor in the relationship between explicit and implicit vocabulary instruction (e.g. Alamri & Rogers, 2018; Hennebry, et al., 2017; Paribakht & Wesche, 1997; Sonbul & Schmitt, 2009). Moreover, these studies have only focused on one of the possible time sequences, i.e. explicit pre- or post-teaching of the target L2 words accompanied by meaning-focused input, for the combined delivery of implicit and explicit vocabulary instruction.

Paribakht and Wesche (1997) launched a study about the comparative effete of read-only vs. read-plus conditions on English vocabulary learning among a heterogeneous group of L1-background learners in Canada. The read-plus condition provided some explicit vocabulary teaching activities including L2 definitions, synonyms, and exemplar sentences while the other group did not receive any post-teaching explicit elaborations. Data analysis revealed that both types of treatments lead to significant lexical gains; however, the second treatment condition the (reading + explicit exercises) could help the participants to significantly learn more words with deeper quality for the acquired words, i.e., post-reading explicit instruction significantly fostered the breadth and depth of target L2 words. Of course, the researchers only used a pertest-treatment-posttest design with vocabulary tests that measured a whole range of vocabulary mastery while they could use a battery of tests to better tape into the receptive and productive lexical knowledge gained by the given treatments. Zimmerman (1997) also conducted a similar study with the aforementioned design and treatment conditions and showed that the study group which completed some explicit interactive vocabulary tasks after reading passages including the target words significantly gained more words compared with a reading-only group. Zimmerman's (1997) study also suffered from some

methodological shortcomings witnessed in Paribakht and Wesche's (1997) research.

In an experimental study, Sonbul and Schmitt (2009) examined the effectiveness of explicit vocabulary teaching after reading a text including the intended target words (read-plus condition) in comparison with only implicit learning through reading (read-only condition). The direct teaching of target words was done by giving their meanings via L2 definitions and synonyms. These L2 definitions were written on the board and orally repeated by learners. The researchers found that explicit vocabulary instruction after the reading experience could help learners do better on form-recall, meaning-recall, and recognition tests. Of course, the reported gains for the meaning recall test were fairly modest because the participants in the read-plus and read-only groups could only recall 19% and 7% of the initially learned words. Sonbul and Schmitt's (2009) study also suffered from some methodological setbacks such as the small sample size, the gender of the participants, word selection and the used vocabulary measures. The participants were limited to female ESP learners and the classification of the 20 selected words into read-only and read-plus conditions was based on the word difficulty and lower frequency, i.e. more difficult and less frequent ones were more taught in the read-plus group which makes the results of the study biased and the authors did not justify this procedure.

Hennebry, et al. (2017) inspected the effect of direct vocabulary teaching after a focus-on-meaning listening activity on L2 lexical recognition and recall under two experimental conditions: provision of L1 translation or L2 synonyms and definitions among 262 English-speaking learners of French as an L2 in the UK. The results of this study indicated that direct vocabulary teaching after the listening activity helped learners recall L2 words significantly better than their counterparts in the listening-only group who did not receive any post-listening direct vocabulary teaching. Contrary to Sonbul and Schmitt (2009), Hennebry, et al.'s (2017) findings showed considerable gains for both vocabulary recognition and recall tests in favor of those who received explicit post-listening

instruction. Hennebry, et al.'s (2017) study, however, had its own shortcomings including the target word selection criteria and treatment conditions. The target words were not selected systematically through a robust procedure from well-established and valid word lists and no information has been provided about the nature of the selected words from the listening files that were utilized in the administered treatments. Moreover, the study only considered the post-listening instruction as the most frequently given type of explicit vocabulary instruction in two simple conditions while it could more conditions and better treatments.

Alamri and Rodgers (2018) compared the effects of visual versus written explicit instruction of L2 vocabulary before and after the meaning-focused-experience implemented through reading or listening tasks on 88 EFL learners' vocabulary development and retention. There were six experimental and two control groups in the study that were taught 69 academic words selected from a textbook written for technology, engineering, and applied sciences. The results of this study revealed positive significant effects for pre- meaning-focused experience activities on both learning and recalling the target words through visual explicit instruction. The obtained gain scores for both immediate and delayed posttests showed significant growth compared with pretest scores for the experimental group who received direct visual vocabulary-teaching tasks before the meaning-focused input. Despite their innovative research design, Alamri and Rodgers (2018) mostly investigated the effect of their various types explicit instruction on the acquisition and retention of concrete words that only shape a small bulk of L2 vocabulary and have somehow excluded the larger portion of abstract words which their mastery as pointed out by Schmitt (2019) pose a more perplexing challenge for both learners and teachers. Moreover

Unfortunately, as aforementioned, comparatively little research has been done to compare the effects of various sequences of implicit and explicit teaching on L2 vocabulary development and retention and a serious research gap is felt in this regard. The importance of getting empirical insight into the optimal time for coalescing explicit teaching of

L2 words into the meaning-focused input and the paucity of research about this issue motivated the current study. Specifically, the following research questions were framed in the present research attempt:

1. Does explicit teaching of vocabulary before, during, and after the meaning-focused experience have any significant effect on Iranian EFL learners' vocabulary development?
2. Does explicit teaching of vocabulary before, during, and after the meaning-focused experience have any significant effect on Iranian EFL learners' vocabulary retention?
3. What are the target participants' attitudes about the effectiveness of explicit teaching of vocabulary before, during, and after meaning-focused experience for EFL vocabulary development?
4. What is the most effective time for explicit teaching of vocabulary: before, after or during the meaning-focused experience?

Method

The present study attempted to examine the optimal time for explicit L2 vocabulary instruction accompanied by implicit meaning-focused input through an explanatory mixed-method design. The larger quantitative phase was implemented through a pre-, post- and delayed posttest quasi-experimentation using three intact classes selected based on convenience sampling. This first phase was followed by a smaller qualitative study carried out via oral interviews. The details for the adopted design will be inspected in this section.

Participants

A convenience sample of 66 upper-intermediate EFL learners from three equal-sized intact classes each comprising 22 learners at a private language institute in Tehran participated in the first phase of the study including both females ($n=40$) and males ($n=26$). Their age range varied from 14 to 28 ($M=19.4$, $SD= 2.8$) and they were high school (62%) and BA/BS (38%) students with different study majors. When this study started, the students were in the second semester of their third year at the language institute, and they had been learning English for at least three

years. Based on their previous semester report cards and results of two placement tests administered by the institute, the participants were upper-intermediate EFL learners. Their first language was mostly Persian and in some cases other languages like Turkish and Kurdish. The selected classes were randomly assigned to three study conditions (henceforth Classes A, B, and C). However, a total of 62 learners ended up participating in all sessions, 22 in Class A and 20 in each of the other two classes. There was no control group receiving only indirect (implicit) vocabulary teaching in the study for two reasons: first, the researchers did not have access to more intact classes and second, more significant impact of direct (explicit) instruction on L2 vocabulary development and retention compared with implicit instruction has empirically established by the ample previous research as sketched in the reviewed literature. Accordingly, the comparison was not the focus of this study. The learners who participated in the qualitative phase were 25 percent of the study participants (5 learners from each class) who volunteered to attend semi-structured oral interviews.

Instruments

This study used two types of instruments: Test of the Academic Word List (Tests A & B) and semi-structured oral interviews.

Test of academic word list. This test assesses EFL/ESL learners' receptive knowledge of the 570 frequent academic words in Coxhead's (2000) Academic Word List (AWL) and includes 19 groups of six-word sets and three matching options. Therefore, the test has 57 items and the learners' total score on the test can be multiplied by ten to determine the total number of English words known by the learner. Therefore, if a learner's score is 35, he knows 350 out of the 570 words in the AWL. This also implies that this particular learner should acquire the other 200 words he does not know. The same test has two equivalent versions: A and B. This test was initially proposed by Coxhead (2000) and designed by Flavel (2002, cited in Schmidt, 2016) and later revised and expanded by Nation

three times (2003, 2006, 2012). The reliability of the test has been reported with indices above .80 by many researchers (e.g. Beglar & Nation, 2007; Coxhead, Nation, & Sim, 2015; Nguyen & Nation, 2011). Besides, this test has high content validity for the purposes of the current study because it estimates the receptive vocabulary knowledge for the reading book, i.e. Focus on Vocabulary 2. Version A test was used as the pretest; however, version B was given as the posttest a day after the treatments finished and two weeks later as the delayed posttest (after a fourteen-days retention interval). It took from 30 to 50 minutes for the learners to complete these tests.

Semi-structured oral interview. Twenty-five percent of participants from each group was randomly selected for the small qualitative phase of the current study and they were orally interviewed by the lead researcher. They were asked two questions about the type of explicit vocabulary teaching and their attitudes and preferences in this regard. Their answers were audio-recorded with their permission and later were transcribed using MAXQDA software (2018 version) to find patterns in their answers. No time limit was imposed and the learners provided open-ended lengthy answers to the point they desired; however, they generally lasted from 15 minutes to half an hour (average time $M=20.4$). The oral interviews were conducted in face-to-face encounters between one of the researchers (the lead researcher) and the honorable interviewees. The two questions posed were as follows:

- 1) *What are your attitudes towards direct (explicit) vocabulary teaching you received before/during/after the reading experience?*
- 2) *Could it help you notice, learn, memorize and recall the target words effectively? How and why?*

Materials

The reading book used for the implicit meaning-focused vocabulary learning was Focus on Vocabulary 2. The book has been developed based on the Coxhead's (2000) Academic Word List (AWL) and covers 570 frequent core academic words across diverse disciplines including history,

natural science, literature, social sciences, psychology, business, linguistics, and different genres such as movies, newspapers, novels and so on. According to Coxhead and Nation (2017), *Focus on Vocabulary 2* accompanied by a 2000-word basic vocabulary aids the learners to understand more than 86% of all English words encountered in academic reading texts. The book has been written by Schmitt, Schmitt, and Mann (2011) in seven units, each including three main chapters and a strategy-review chapter. Each chapter provides a series of exercises on word meanings, word families, comprehension of input, output improvement, reading and vocabulary skills, and collocations. The whole book, hence, has 28 chapters in 272 pages. The current study used the second edition of the book published by Longman. According to the authors, the readability and cognitive difficulty of the texts are appropriate for intermediate and upper-intermediate EFL/ESL learners.

Procedure

This study was conducted to investigate the optimal time for explicit teaching of L2 academic vocabulary. Therefore, three groups of learners were conveniently selected from three intact classes at a private language institute in Tehran in 2017 and were randomly assigned to three experimental groups. Then, the Test of the Academic Word List (Version A) was given to check their receptive vocabulary knowledge level at the beginning of the study. Afterward, the treatments were given. In class A, students received explicit vocabulary instruction before the meaning-focused experience through definitions, synonyms and antonyms, and Persian equivalents as the last resort. In class B, explicit vocabulary teaching was concurrent with the meaning-focused experience (during the reading). In class C, the treatment was the same as in classes A and B; the only difference was that they received the explicit instruction of the vocabulary after the meaning-focused experience. In addition to the mentioned meaning-discovery activities, three types of exercises mostly chosen from the studied book, were used for explicit teaching in all the classes: fill-in-the-blank, meaning-matching, and sentence writing. These

treatments were given to students for 20 one-hour sessions twice a week during the summer semester.

After the treatments, Version B of the AWL Test was given to the students as the posttest to check their core academic vocabulary improvement. The same test was administered 14 days later as the delayed posttest to check learners' retention of the mastered words. The chosen retention interval (RI) was determined based on the research-based criteria for the time distance for the available intersession interval (ISI) set by Rohrer and Pashler (2007) and other significant studies in this regard (e.g. Serrano & Huang, 2018; Suzuki, 2017; Toppino & Gerbier, 2014). The most frequently accepted and adopted norm was that the ratio of intersession interval to retention interval should be 25% (ISI/RI ratio =25%). There were two ISIs in this study: one from Monday to Thursday (3 days) and another one from Thursday to Monday through Friday (4 days). In the current study, the average ratio of 3.5-day ISI to the 14-day equals 25%. According to Serrano and Huang (2018), giving a posttest before or after this optimal time either exaggerates or underestimates the true effect of the given treatments.

After gathering the quantitative data, a smaller qualitative phase was launched during which 25% of the participants in each group (5 learners) were randomly selected for the oral interviews and their attitudes were elicited about the type of the treatments they received for explicit L2 vocabulary instruction as implemented in the quantitative phase of the study. These oral semi-structured interviews were audiotaped and transcribed using MAXQDA software (2018 version) for further qualitative inquiry.

Data Analysis

IBM SPSS program (version 25) was used for quantitative data analysis. This study used both descriptive and inferential statistics. Descriptive Statistics were used to check the normality of the tests, their assumptions, and features of the test such as mean, maximum, minimum, standard deviation, skewness, kurtosis, and other features. The data

collected in the first phase of the study were inferentially analyzed using a one-way analysis of covariance (one-way ANCOVA) for answering each of the first two questions. According to Tabachnick and Fidell (2013), this statistical technique assumes a lack of univariate and multivariate outliers, normality of subgroups' distributions, homogeneity of variances, reliable measurement of the covariate prior to the treatments, and linearity and homogeneity of regression slopes. Preliminary checks showed that all these requirements were met and no meddlesome violations were observed.

In order to answer the third question, i.e. to analyze the data extracted from the oral interviews, descriptions and qualitative interpretations were utilized. Two raters analyzed and coded the qualitative data: the lead researcher and a colleague who are both university professors at two high-ranking Iranian state universities. MAXQDA software (2018 version) was used by the two raters to codify the transcriptions of the oral interviews (this software was purchased or freely downloaded for a 14-day trial from <https://www.maxqda.com/>). Then, the MAXQDA Intercoder Agreement Function was run to calculate the intercoder reliability which is a necessity for content analysis in qualitative inquiry. The calculated average percentage agreement turned out to be 90.22%, indicating a high agreement as mentioned by qualitative research literature (e.g. Gwet, 2014; Lombard, Snyder-Duch, & Bracken, 2002) between the codifications done by the two independent raters. The final conclusions and interpretations (research question 4) were made based on combining the results of the quantitative and qualitative analyses.

Results

The first two questions were answered using quantitative data analysis and the third question was answered by means of the qualitative interpretations and descriptive statistics. The fourth question sought to combine and integrate the results of the first three questions. The reliability indices for the pre-, post-, and delayed posttests in the current study were .79, .82, and .81, respectively signifying high reliability of the

used instruments. Mean scores and SD values for performances of all three study groups on the AWL pre-, post-, and delayed posttests are presented in Table 1.

Table 1.

Means and SDs for Three Groups' Scores on The AWL Pre-, Post-, and Delayed Posttests

	N	Pretest		Posttest		Delayed Posttest	
		Mean	SD	Mean	SD	Mean	SD
Group A	22	28.45	8.969	38.86	8.008	36.86	8.008
Group B	20	27.55	7.681	40.65	7.073	38.95	7.141
Group C	20	27.35	7.721	34.85	8.312	32.90	8.277
Total	62	27.81	8.055	38.15	8.061	36.26	8.094

As shown in this table, learners' AWL mean scores were very close on the pretest; however, a noticeable increase was observed from the pre- to posttest across all the groups. The mean scores slightly decreased after a 14-day ISI on the delayed posttest. The highest post- ($M=40.65$, $SD=7.07$) and delayed posttest ($M=38.95$, $SD=7.14$) scores were obtained by Group B learners, followed by mean scores of Group A learners' post- ($M=38.86$, $SD=8$) and delayed posttest ($M=36.86$, $SD=8$) mean scores. The lowest mean scores on the immediate ($M=34.85$, $SD=8.31$) and delayed ($M=32.90$, $SD=8.27$) posttests belonged to Group C.

Research Question One

The application of the Levene's test ($F(2, 59) = 1.527$, $p = .226 > .05$) revealed that the assumption of homogeneity of variances was retained. Furthermore, the ANOVA test of linearity for the relationship between pre- and posttest scores ($F(1, 35) = 370.816$, $p < .05$) demonstrated that there was a linear relationship between the dependent variable and the covariate.

Table 2.

ANOVA Test of Linearity for the Relationship between Pre- and Posttest Scores

			<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Pretest *	Between	(Combined)	3648.594	26	140.331	15.891	.000
Posttest	Groups	Linearity	3274.660	1	3274.660	370.816	.000
		Deviation from Linearity	373.934	25	14.957	1.694	.074
	Within Groups		309.083	35	8.831		
	Total		3957.677	61			

One-way ANCOVA also assumes that the linear relationship between the dependent variable and the covariate, i.e. the homogeneity of the regression slopes, should be the same across the groups. The non-significant interaction between the covariate and the independent variable (three types of treatments) ($F(2, 56) = 1.179, p = .315 > .05$, partial $\eta^2 = .040$, representing a weak effect size) shown in Table 3 indicated that the assumption of homogeneity of regression slopes was met.

Table 3.
Testing Homogeneity of Regression Slopes for Posttest Scores by Different Groups

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Group	64.180	2	32.090	5.091	.009	.154
Pretest	3175.576	1	3175.576	503.828	.000	.900
Group * Pretest	14.868	2	7.434	1.179	.315	.040
Error	352.963	56	6.303			
Total	94177.000	62				

Table 4 displays the descriptive statistics for the immediate posttest scores after controlling for the effects of the pretest. Based on these results, it can be claimed that the participants who received direct vocabulary instruction simultaneous with meaning-focused experience gained the highest mean ($M = 40.88$). This was followed by Group A ($M = 38.27$) and Group C ($M = 35.26$) whose participants were given direct vocabulary instruction before or after the meaning-focused experience.

Table 4.

Estimated Marginal Means for Vocabulary Posttest Scores by Study Groups

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Group A	38.276 ^a	.538	37.200	39.352
Group B	40.883 ^a	.563	39.755	42.010
Control C	35.264 ^a	.563	34.136	36.392

The following figure provides a vivid picture of the differences between the mean scores obtained by different groups after detaching the effect of the covariate:



Figure 1.

Posttest scores by three study groups

Table 5 displays the main results of the one-way ANCOVA based on which ($F(2, 58) = 24.931, p < .05$, partial $\eta^2 = .462$ representing a large effect size), it can be concluded that there were significant differences between the three groups' means on the posttest of vocabulary after controlling for the effect of the pretest.

Table 5.

ANCOVA Results for the Posttest Scores Obtained by Study Groups

Source	SS	df	MS	F	p	Partial η^2
Pretest	3241.861	1	3241.861	511.182	.000	.898
Group	316.225	2	158.113	24.931	.000	.462
Error	367.830	58	6.342			
Total	94177.000	62				

It should also be noted that the significant F-value associated with the covariate (pretest) ($F = 511.182.57$, $p < .05$, partial $\eta^2 = .898$) indicated that the pretest was correctly chosen as a covariate, i.e. it had a significant role in this model and could explain about 89.8 percent of the variation in the posttest scores. Post-hoc comparison tests (Table 6) were employed in order to compare the groups two by two to locate the exact place of the differences.

Table 6.

Pairwise Comparisons for Posttest Scores by Study Groups

(I) Group	(J) Group	Mean Difference (I-J)	p
Group A	Group B	-2.607*	.001
	Group C	3.012*	.000
Group B	Group C	5.619*	.000

The pairwise comparisons indicated that Group A that received explicit vocabulary teaching before meaning-focused experience (adjusted $M = 38.27$) significantly outperformed Group C (adjusted $M = 35.26$) on the posttest of vocabulary (Mean Difference = 3.012, $p < .05$). Moreover, Group B (adjusted $M = 40.88$) significantly outperformed group C ($MD = 5.619$, $p < .05$) and Group A on the vocabulary posttest ($MD = 2.607$, $p < .05$).

Research Question Two

Another one-way ANCOVA was applied to examine the effect of three times of direct vocabulary teaching on EFL learners' vocabulary

retention. Running Levene's test revealed that the assumption of homogeneity of variances was not violated ($F(2, 59) = 1.269, p = .289 > .05$). ANOVA Test of Linearity made it clear ($F(1, 34) = 438.398, p < .05$) that there was a linear relationship between the dependent variable and the covariate.

Table 7.

ANOVA Test of Linearity for the Relationship between Pretest and Delayed Posttest Scores

		<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Pretest *	Between (Combined)	3702.761	27	137.139	18.291	.000
Delayed	Groups					
	Linearity	3286.912	1	3286.912	438.398	.000
Posttest	Deviation from	415.848	26	15.994	2.133	.019
	Linearity					
	Within Groups	254.917	34	7.498		
	Total	3957.677	61			

As displayed in Table 8, there was not a statistically significant interaction between the pretest scores and the three groups posttest scores ($F(2, 56) = 1.127, p = .331 > .05$, partial $\eta^2 = .039$, representative of a small effect size). Therefore, it was concluded that the assumption of homogeneity of regression slopes was retained.

Table 8.

Testing Homogeneity of Regression Slopes for Delayed Posttest Scores by Different Groups

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Group	58.204	2	29.102	5.091	.009	.154
Pretest	3224.108	1	3224.108	564.020	.000	.910
Group *						
Pretest	12.884	2	6.442	1.127	.331	.039
Error	320.113	56	5.716			
Total	85504.000	62				

The next table displays the descriptive statistics for the estimated marginal means at the delayed posttest for the study groups after detaching the covariate effect.

Table 9.

Estimated Marginal Means for Vocabulary Delayed Posttest Scores by Study Groups

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Group A	36.272	.511	35.248	37.296
Group B	39.184	.536	38.111	40.257
Group C	33.317	.536	32.244	34.390

According to Table 9, learners who received direct vocabulary teaching during their meaning-focused experience ($M = 39.18$) had the highest mean score, followed by participants who received their special treatments before ($M=36.27$) and after ($M=33.31$) the meaning-focused experience. Furthermore, the mean scores have somehow decreased from the posttest to the delayed posttest for about two scores. Figure 2 clearly illustrates the differences between the mean scores gained by the three groups on the delayed posttest after removing the covariate effect:

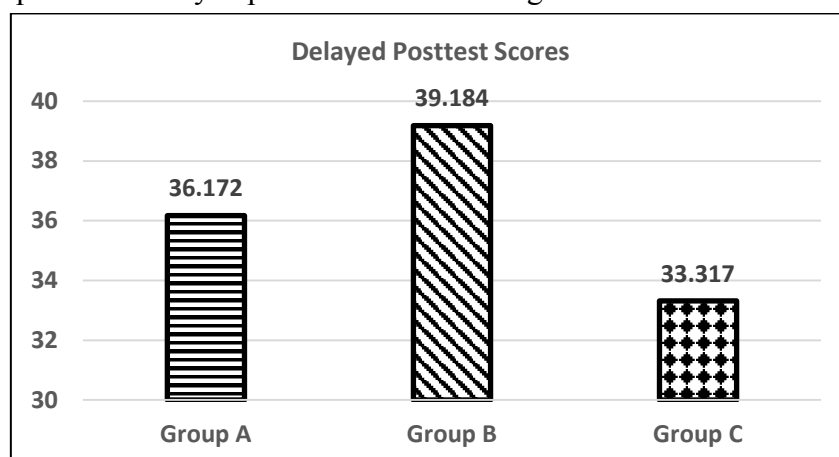


Figure 2.

Delayed posttest mean scores by three study groups

Another one-way ANCOVA (Table 10) was applied to examine the effect of time of explicit vocabulary teaching on EFL learners' vocabulary retention, revealing that there were statistically significant differences among the three groups' performances on the delayed posttest ($F(2, 58) = 29.979$, $p < .05$, partial $\eta^2 = .508$, indicative of a large effect size) after removing the effect of the covariate (pretest scores).

Table 10.

ANCOVA for the Delayed Posttest Scores Obtained by Study Groups

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Pretest	3284.344	1	3284.344	572.054	.000	.908
Group	344.242	2	172.121	29.979	.000	.508
Error	332.997	58	5.741			
Total	85504.000	62				

Moreover, the covariate could significantly explain about 90% of the variance for the participants' scores on the delayed posttest ($F(1, 56) = 572.054$, $p < .05$, partial $\eta^2 = .908$). Post-hoc comparison tests (Table 11) were run to pinpoint the exact location of the differences as follows:

Table 11.

Pairwise Comparisons for the Delayed Posttest Scores by Study Groups

<i>(I) Group</i>	<i>(J) Group</i>	<i>Mean Difference (I-J)</i>	<i>p</i>
Group A	Group B	-2.912*	.000
	Group C	2.956*	.000
Group B	Group C	5.867*	.000

The pairwise comparisons showed that learners in Group B (adjusted $M = 39.18$) significantly excelled group C (adjusted $M = 33.31$) on the delayed posttest ($MD = 5.867$, $p < .05$) and Group A learners (adjusted $M = 36.27$) on the same test ($MD = 2.912$, $p < .05$). Additionally, Group A significantly did better than Group C on the delayed posttest ($MD = 2.956$, $p < .05$). Accordingly, it was decided that explicit vocabulary teaching

during the meaning-focused experience for both vocabulary development and retention was significantly more effective than the other two times (pre- and post-teaching times). Moreover, receiving explicit vocabulary instruction prior to the meaning-focused experience could better increase learners' vocabulary growth and retention compared with getting this instruction after such experience.

Research Question Three

The oral interviews were analyzed, transcribed, codified, and categorized using MAXQDA software. Some major themes were extracted from the qualitative data analysis. First, learners who received explicit vocabulary teaching concurrent with the reading experience expressed more positive attitudes. Group B participants who received explicit vocabulary teaching during the meaning-focused experience of reading expressed more positive attitudes toward the usefulness of the received treatment. Second, it was deciphered that receiving explicit instruction of new words concurrent with encountering the target words in reading texts could help learners guess the meaning of the word based on the contextual clues and this, in turn, could help them feel more motivated to gain vocabulary knowledge about the word through explicit on-the-spot activities. Mahshid, one of the participants, for example, said that:

when I receive extra information about the word that I have come across, I can learn the word better especially if I can do some exercises using that word while its use in context is in front of my eyes.

Third, the usefulness of concurrent teaching of words during the meaning-focused experience was attributed to the double effect of the synchronous implicit-and-explicit treatment that, in turn, can foster their intake of the word, its meaning, spelling, part of speech, and use and can also aid learners to retain the word for longer periods of time. Arash, for instance, emphasized the value of implicit-explicit instruction mixture for vocabulary learning and remarked that,

when I first notice the word in a sentence in a broader context of a paragraph or a text, I will try to guess the meaning of the word, of course, if I do not know the meaning. Then, I try to remember the word and other surrounding words. All these unique features help me to learn and feel more capability for learning. My willingness to learn and sharpened curiosity absorb the teacher's extra information and finally when I am engaged in doing some exercises such as fill-in-the-blanks and sentence writing, I really internalize the word.

Another emerged theme was about the drawbacks of concurrent vocabulary explicit instruction accompanied by reading passages. All participants advocated the explicit teaching of new words through various exercises during the meaning-focused experience; nonetheless, they disagreed that such explicit activities should come after reading the sentence or the short paragraphs including the sentence within which the target word was embedded. The reasons put forward in their support of such treatment included the strong mnemonic aspect, more complete cognitive chain, and motivating nature of the double treatment they received. Regarding these advantages of explicit vocabulary teaching activities during the meaning-focused experience, Sarina, one of the learners in Group B, enthusiastically mentioned that:

when I see a new word in the context, first of all, I try to guess its meaning and then I am eager to know more about it and do some exercises and when I treat the words in this way I feel motivated, interested, and active during reading the passages. Moreover, I feel more willing to give and take information about the word.

Another elicited theme indicated that explicit pre-teaching activities assisted the participatory EFL learners to notice the target words in the subsequent reading texts and that such noticing was helpful in learners' intake of the target words for they were familiar with the phonological and orthographic features of those words as well as their meanings in advance. Farid (a pseudonym), for example, said that:

direct pre-teaching of English vocabulary during the educational semester increased my comprehension of the meanings of the words in the related reading passages we read subsequently.

With regard to the effectiveness of the explicit vocabulary pre-teaching, it was observed that these activities helped Group A learners memorize the words more easily when encountered again in the unit. For instance, Parisa (all the names of Persian pseudonyms used for ethical issues and confidentiality), told that:

pre-teaching of words could help me remember the meaning, spelling, and part of speech of a target word better after I came across them in the texts. I also think such pre-teaching exercises could help me recall the meanings of those words that I learned during the term.

Another additional pattern located in the qualitative data was spotted for Group B learners; four of the students expressed that pre-teaching of vocabulary motivated them in better ways and prepared their minds for greater learning. Only one of the oral interviewees in this class was not satisfied with the received treatment, however. She commented that:

explicit pre-teaching of new words is not helpful because it is done before having any idea about the meanings of the words in the context of the target text. I think isolating the words and taking them out of their contexts is not as useful as it may seem, at least it was not helpful for me (Parnian).

As far as the explicit post-teaching of vocabulary is concerned, diverse and sometimes opposing themes were elicited. Three of the students in Class C claimed that when new words are post-taught, they feel they have met the words previously; however, two other learners expressed their hesitation about such feelings arguing that when the words are not brought into their notice during reading the text, they do not stick in their minds. Dorsa, for instance, cited that:

when our teacher said we are going to do some exercises about the new words of the unit, I was puzzled a little since I felt I did not notice them at all. Thus, in my opinion, it is much better to introduce the words during reading and then do some activities after reading the text has finished.

Regarding the deeper learning of the words, three participants unanimously agreed that post-teaching tasks and exercises could solidify learning, memorizing, and recalling of the meanings and forms of those words. Nima, for example, uttered that:

post-teaching tasks and exercises increase my comprehension of the meanings of the words that I have already seen in the reading passages and help me memorize and remember the words in better ways.

Finally, it was unraveled that post-teaching tasks had their own drawbacks. For example, two of the participants in Class C expressed concerns about the effectiveness of post-teaching activities arguing that they either did not like them or at least these activities did not suit their learning styles.

As understood from their answers in the oral interviews, participants who received explicit vocabulary-teaching concurrent with reading texts had more positive attitudes and more motivating feelings for noticing, intaking and retaining the target words. Furthermore, learners who were pre-taught the intended vocabulary had slightly more positive views and opinions about the best time for direct vocabulary teaching in comparison with those learners (Group C) who received the post-teaching of L2 words.

Research Question Four

To answer the fourth research question, the foremost question in the present mixed-method, the results of the first two research questions in the quantitative phase and question three in the qualitative phases should be merged as proposed by mixed-method scholars (e.g. Creswell, 2012, 2014;

Plano Clark, 2010). Creswell (2014), for instance, has suggested that reporting explanatory sequential mixed study results “follows the form of first reporting the quantitative, first-phase results and then the qualitative, second phase results. However, this design then employs a third form of interpretation: how the qualitative findings help to explain the quantitative results” (p. 274).

In the current study, results of the larger quantitative phase showed that explicit vocabulary teaching during reading texts could help learners do more significantly better than those who received pre- or post- teaching direct vocabulary instruction on the immediate and delayed posters. Furthermore, learners who were pre-taught vocabulary outperformed those participants who received post-teaching instruction on the post- and delayed posttests. The results of the qualitative phase also revealed that participants had more positive attitudes about the concurrency of explicit and implicit vocabulary learning for L2 vocabulary development and retention. They also showed slightly more positive attitudes and views about pre-teaching of L2 words compared with post-teaching. Therefore, the results of the two phases of the study converge and this conclusion can be drawn that the optimal time for explicit vocabulary development and retention accompanied by meaning-focused input is its incorporation during the meaning-focused experience.

Discussion

The joint interpretation of both quantitative and qualitative analyses in the present study revealed some significant findings. First, explicit/direct vocabulary teaching was more effective for both learning and retaining L2 words when it was concurrent with the meaning-focused input through reading texts including the target words rather than when the target words were pre- or post-taught directly. So, it was deduced that the most effective time for explicit teaching of L2 vocabulary was while meaning-focused input as defined through reading in the current investigation. Second, explicit pre-teaching of L2 vocabulary turned out to be more effective than the post-teaching of these words as found by

quantitative analysis and qualitative descriptions given by the participatory EFL learners.

The superiority of explicit vocabulary-teaching during the meaning-focused experience can be attributed to the prominent features of the combination of explicit and implicit instruction cited in the current literature (e.g. Elgort et al., 2016; Nation, 2013; Schmitt, 2019) such as the stronger associations between form and meaning provided by rich contextual clues, the simultaneous interaction between the learner, the text and other players in the scene of learning, i.e. the teachers and peers who could provide scaffolding and feedback. The findings of the current study are strongly supported by existing theories and literature about L2 vocabulary development. A meticulous review of the previous research has culminated to this point: L2 vocabulary acquisition is exponentially facilitated when meaning-focused experience and contextual learning are accompanied by deliberate or direct elaborations (Elgort et al., 2016; Laufer, 2005; Schmitt, 2008). For example, having elaborated on the challenges of contextual indirect word learning through meaningful input, Elgort et al. (2016) found that “deliberate learning procedures may be particularly beneficial for English language learners whose L1 is not alphabetic” (p. 648).

The effectiveness of the concurrent integration of both explicit (direct) and implicit (indirect) L2 vocabulary teaching has received substantial support from the leading theories such as lexical quality hypothesis (Perfetti & Hart, 2000; Perfetti, 2007) and instance-based framework of word learning (Bolger et al., 2008; Reichle & Perfetti, 2003). According to the first aforementioned hypothesis, more deliberate focus on the form of a newly encountered word and more practice on it right after deciphering its meaning can enhance the internalization of the word and can facilitate its recall. The latter theory claims that the first encounter with a novel word provides episodic traces that get stronger after more encounters with the word in multiple contexts. Moreover, the lexical knowledge aspects that are repeated in different encounters are learned more rigorously and permanently. Reichle and Perfetti (2003) argued that

direct teaching of new words through further elaboration can obviate the need for more encounters or at least dramatically decrease the number of these encounters.

Results of the present study can also be justified in the light of Involvement Load Hypothesis based on which the extra practice with novel L2 vocabulary through the different elaboration procedures and direct exercises increases the learners' involvement with learning the word (Ko, 1995; Schmitt, 2008) that enhance L2 learners' cognitive involvement with the word that, in turn, pave the way for more vocabulary learning. According to Laufer and Hulstijn's (2001) Involvement Load Hypothesis, such involvement is facilitative for lexical knowledge absorption in an L2. In addition, when L2 words are taught or learned through input, instruction, and involvement (3Is as mentioned by Laufer, 2017), they are better ingrained in the mind and more easily retrieved. Simultaneous explicit instruction of the new words during reading a text provides the 3Is to an acceptable extent.

By reviewing the existing literature on the use of direct elaboration and meaning-focused input for L2 vocabulary, it is understood that researchers mainly investigated the post-reading (e.g. Hill & Laufer; Mondria, 2003; Paribakht & Wesche, 1997; Sonbul & Schmitt, 2009; Zimmerman, 1997) or post-listening (e.g. Hennebry, et al., 2017) tasks and elaborations and reported significant effects compared with implicit conditions; however, comparative studies on the pre-, concurrent, and post-teaching of L2 words to date are handful. Therefore, the first finding of the study can not be directly compared or contrasted with earlier empirical studies.

The second finding of the current study is in line with one of the rare studies conducted by Alamri and Rodgers (2018) who investigated the impact of visual versus written explicit instruction of 69 academic L2 English words before and after the meaning-focused-experience implemented through both reading and listening tasks on EFL learners' vocabulary development and retention. The results of this study showed that implicit instruction through a combination of listening and reading

accompanied by explicit teaching of L2 vocabulary could significantly help learners acquire and retain the target words better than only implicit instruction. More importantly, the study results revealed that pre-reading and listening dialogues could help learners significantly do better on both learning (immediate protest scores) and recalling (delayed post-test scores) of the target words through visual explicit instruction than those counterparts who received pre- and post-teaching of written-only dialogues.

Concerning the second finding about the more significant role of pre- rather than post-teaching activities on L2 vocabulary development and retention, it can be argued that as mentioned by Nation (2013), previous encounters with lexical items can trigger the subsequent noticing of these items in the upcoming input and can lead to more lexical intake as supported by Schmidt's (1990) Noticing Hypothesis. Providing learners with direct vocabulary teaching before coming upon those words in oral (listening) or written (reading) input is, in fact, an input enhancement activity that has verified its effectiveness based on lexical form-focused instruction (FFI) as empirically supported by numerous studies (e.g. Hill & Laufer, 2003; Laufer, 2006; Sharwood Smith & Truscott, 2014; Shintani, 2013).

Conclusion and Implications

The main conclusion of the present research was that explicit teaching of L2 vocabulary during the meaning-focused input could help L2 vocabulary development and retention in significantly better ways compared with explicit pre- and post-teaching of the target words. It was also concluded that explicit vocabulary-teaching prior to the meaning-focused experience could help learners acquire and recall words better than explicit post-teaching of these words. It should be noted that the focus of the present study was on comparing the differential effects of the three various types of explicit-implicit instruction on L2 vocabulary development and retention and these two aforementioned conclusions do not relegate the effectiveness of the explicit post-teaching activities on

learning and recalling the target L2 words for the direct post-teaching has proved its efficiency and consolidation impact based on ample research evidence as outlined in the literature review.

The findings of this study have some pedagogical implications for EFL learners, teachers, and syllabus designers. Teachers, for example, are recommended to teach the new words explicitly while they are encountered in the meaning-focused input (provided either through reading or/and listening). Teachers are also recommended to use some explicit pre-teaching activities for the target words that are presented in the successive reading passages. Learners should also pay meticulous attention to the arrangement of the explicit strategies and techniques for vocabulary learning and they should give more weight to the strategies and practices that are used amidst the meaning-focused experience or a priori. Of course, this study does not offer that both teachers and learners should avoid using post-reading explicit instruction for the target words since such activities have robust consolidation effects as mentioned by Laufer (2017). The third group of beneficiaries for the implications of the present study includes syllabus designers and those who are involved in instructional materials development. Syllabus designers and material developers should try to include explicit vocabulary activities and tasks that can be done concurrently with the meaning-focused experience that is mainly delivered through reading and to a lesser extent through listening materials. These activities and tasks should have a considerable variety to help a larger range of students with different cognitive and learning styles learn and retain the words. Though in fewer numbers, explicit vocabulary teaching activities also need to be included as the warm-up or introduction to the main reading passages. Moreover, the syllabus designers are advised not to forget to develop coursebooks or instructional contents that use explicit post-teaching tasks right after the meaning-focused experience to reinforce the power of the initial learning of the words and to lengthen the retention span of the target L2 words.

No study in SLA is free from methodological shortcomings and manageability trade-offs and the present research is no exception;

therefore, researchers had to accept some inevitable limitations and impose some delimitations as follows. The researcher did not have access to a large sample, the randomization of learners was not possible, the proficiency level could not be guaranteed by administering standardized tests, and the gender of the learner was not controlled. Accordingly, future studies can be done through larger samples with more robust methodological procedures to consider factors such as age, gender, proficiency level, learning styles and strategies to further verify the results achieved in this study. Moreover, this study administered one immediate posttest; thus, further research can be launched with more elaborate designs to check vocabulary knowledge gains gradually by giving numerous immediate posttests.

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