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The Effects of Different Pedagogical Interventions on EFL Learners' Receptive and Productive Knowledge of Formulaic Sequences*

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Abstract

This study sought to investigate the effects of Explicit Instruction in combination with Input Enhancement (EI+IE), Input Flood (IF), and Gap-fill (GF) tasks on receptive and productive knowledge of English formulaic sequences (FS) by Iranian intermediate EFL learners. Assigned to three experimental groups, the 110 participants took the receptive and productive knowledge pretests, posttests, and delayed posttests. Findings of within-group (repeated-measures ANOVAs) and between-group (ANCOVAs) tests showed that while IF could not promote learners' performance, both the EI+IE and the GF could improve learners' receptive and productive knowledge of target FSs from pretests to posttests and retained the effects until the delayed posttests. Additionally, both EI+IE and GF groups significantly outperformed the IF group at the immediate posttests. That is, the results from EI+IE did not differ significantly from those of GF. Plausible accounts for the obtained results are provided and the implications are discussed.

Keywords: Input enhancement, Explicit instruction, Input flood, Gap-fill tasks, Formulaic sequences, Receptive knowledge, Productive knowledge

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Introduction

Individual words constitute the basic lexical units in second language (L2) research and pedagogy due to the fact that they lend themselves more easily to identification and instruction (Schmitt, 2010). Yet, ELT is now more sensitive to the abundant use of formulaic sequences (henceforth FSs), claiming that language is not always processed word for word. Research has it that more than half of English discourse – spoken and written – is formed by the use of FSs (Erman & Warren, 2000). Schmitt (2010) argues that native-like command of a language heavily depends on the user's mastery of these sequences. Thus, learning English as a Foreign Language (EFL) proficiently necessitates not only learning FSs but also using them in language production with ease.

However, observations show that second language learners struggle with using FSs even when they enjoy advanced levels of proficiency (Laufer & Waldman, 2011). The first problem is that learners produce far fewer FSs compared to native speakers (Nesselhauf, 2003). The second stubborn hardship is the learners' errors in using collocations, which mainly stem from differences in crosslinguistic phraseology (ibid). The negative influence that such errors can have on the L2 learners' linguistic performance is hard to ignore since it significantly lowers the estimates about their linguistic knowledge (Boers, Eyckmans, Kappel, Stengers, & Demecheleer, 2006). The question that remains to be addressed is how teaching techniques and classroom activities can pave the way for learning and acquiring L2 phraseology.

The acquisition of FSs in both L1 and L2 has not been sufficiently investigated, leaving the field no choice but to generalize the assumptions, conditions and results gained from research on vocabulary learning and acquisition to FSs (Nation, 2001). Among these, one can find noticing, production and generation of vocabulary items deemed transferable to the learning of FSs. Nation (2001) argues that knowing a word necessitates knowing the form, meaning, and usage of that word. He goes further to extend the same to the knowing of formulaic sequences. By virtue of such a definition, knowing a word or a

formulaic sequence involves both receptive knowledge (knowing the form and meaning) and productive knowledge (knowing the usage). Receptive knowledge is commonly defined as passive knowledge – the knowledge at work when reading or listening. Productive knowledge of vocabulary, however, means that the learner is able to actively use the words in writing and speech, hence also referred to as active knowledge. Thus, productive knowledge of vocabulary entails the learner's ability to generate words for the purpose of communicating thoughts and feelings in a way that messages are understood by others (Webb, 2005). Productive knowledge of a language means that the user can retrieve structures and meaning from memory and readily use them to get a message across (Webb, 2009). In this study, C-test tasks are used to gauge productive knowledge of FSs.

Li & Schmitt (2008) presents a longitudinal case study investigating the learning of FSs and the processes therein when writing production in an L2 is concerned. The study shows that learning FSs is incremental in nature, which bears resemblance to the learning of vocabulary items. Other longitudinal pieces of research exploring the impacts of explicit instruction share the same view (e.g., Jones & Haywood, 2004; Schmitt, Dorneyei, Adolphs, & Durow, 2004). This justifies the rationale behind the heavy reliance of the field on vocabulary acquisition research when it comes to investigating formulaic sequences. Adopting the approach used in teaching of vocabulary, Jones & Haywood (2004) and Schmitt et al. (2004) investigated the effects of explicit instruction of the acquisition of formulaic sequences. The results were promising in that learners' production showed significant improvements. C-test being the medium of assessment, these studies used the same practices in teaching vocabulary which have proved effective. These practices yielded similar results in the teaching of formulaic sequences. Yet, the aforementioned studies each had pitfalls that question the cogency of their argument and, in turn, the results gained.

Schmitt et al. (2004), for instance, lacked a control group and the participants' input was not controlled, meaning that the significant improvements in the participants' production of FSs could not be

attributed to explicit instruction. Some variables like the great exposure to ESL that the students enjoyed and the ESL program which they were attending were not accounted for. Thus, the higher figures in achievement under a controlled situation could be the result of any individual one of these variables or the result of all of them combined. A further shortcoming is that the participants' ability to produce FSs in uncontrolled condition was ignored. The question arising here is whether the learners involved in this study were able to make use of the target FSs on their own, i.e. uncontrolled.

Jones and Haywood (2004) addressed the use of FSs in uncontrolled situations and reported significant gains in the identification of FSs. Controlled production (i.e. C-test), however, improved much less and there was no significant difference between the explicit instruction group in uncontrolled production (i.e. essay) and the control group. Their research involved a small treatment group of 10 participants only and it spanned a period of 2 weeks, two weaknesses that negatively affect the generalizability of the results.

More experimental research needs to be carried out over longer periods of time to more accurately measure the impacts that explicit instruction can have on productive knowledge of FSs. The present study is an attempt to compensate for the shortcomings in Jones and Haywood (2004). It also takes other pedagogical interventions devised for expediting and strengthening the acquisition of FSs into consideration.

One pedagogical intervention worthy of a note is form-focused instruction. Form-focused instruction encompasses different pedagogical interventions: implicit ones such as input flood and input enhancement; and explicit, such as focus on forms or consciousness raising (Doughty, 2004). These can all be used as classroom practices, yet the question is which one can yield the best results by paving the way for the teaching of FSs. As it was previously mentioned, most of the studies lend support to the effectiveness of explicit instruction as a means to raising learners' awareness of formulaic sequences, to helping fluency and to improving the retrieval of FSs from memory, implicit instruction being paid inadequate attention. Another point to consider is

that none of those few experimental studies use interactive tasks, which have been empirically proved to be effective as a focus-on-form classroom activity. Additionally, explicit focus on form instruction is time-consuming, which makes it impossible to address all other FSs. Thus, implicit interventions like input enhancement, input flood, collaborative Gap-fill tasks targeting other FSs are considered in the present study. Han et al. (2008) explains that input flood increases the frequency of language feature in question; that is, discourse is intentionally engineered to contain more instances of a particular language feature. This artificial salience is believed to be effective in that it borrows its tenets from repetition – an indisputable factor in gaining L2 proficiency (Ellis, 2002). A growing body of research indicates that repetition plays a significant role in mastering an L2 (e.g. VanPatten, Williams, & Rott, 2004). Vocabulary learning research suggests that for an unknown individual word to be learnt, it needs to be seen or heard by the learner several times (Pigada & Schmitt, 2006; Chen & Truscott, 2010). It can also be inferred from these findings that repetition can be interacting with other variables influencing L2 vocabulary acquisition.

Research on vocabulary learning has well emphasized the importance of input enhancement and repetition in learning single words in L2. Yet, what needs further scrutiny is whether FSs follow suit or not. So far, the effect of input enhancement on learning of FSs has not been focused on in research.

The pedagogical implications of formulaic sequences in the acquisition of L2 have only recently come to the fore. Being at its infancy, research on the acquisition, processing and the productive use of FSs for learners of English as a second language suffers from inconclusiveness (e.g. Schmitt & Carter, 2004). The paucity of research is even more severe in case of classroom techniques and practices to ease the acquisition of FSs. AlHassan and Wood (2015), Čolović-Marković (2012), Friginal (2013), Alkazemi and Grami (2016), Jones and Haywood (2004), Millar (2011), Nguyen (2014), Rott (2009) are examples of the few studies providing empirical evidence of the

effectiveness of classroom intervention techniques. Awareness raising, encouraging lookups through explicit instruction or input enhancement, using corpora, and semantically focused instruction for the purpose of easier memorization of FSs (Boers & Lindstromberg, 2012), show significantly facilitative effects and some less promising evidence as to whether particular types of instruction are or are not effective on acquisition of L2 formulaic sequences and to what extent. In addition, this research area has predominantly focused on techniques such as explicit instruction which encourage memorization of FSs. To address the semantic aspects of formulaic sequences, more research needs to be done on intervention types which are more appropriate for EFL classes.

Using the key factors mentioned above, the present study was designed to examine the effectiveness of (i) Input Enhancement + Explicit Instruction, (ii) input flood, and (iii) Collaborative Gap-fill tasks on the acquisition of English FSs by Iranian intermediate EFL learners. This piece of research separately examined the effects of the treatments on the students' receptive and productive knowledge of FSs.

This study

This study aimed to investigate the effects of three types of interventions on the gain and production of English FSs as were measured through the receptive and productive knowledge tests. This study aimed to address the following research questions:

Q1. Do Explicit Instruction + Input Enhancement, Input flood, and Gap-fill have any effects on Iranian EFL learners' *receptive* knowledge of target FSs?

Q2. Do Explicit Instruction + Input Enhancement, Input flood, and Gap-fill have any effects on Iranian EFL learners' *productive* knowledge of target FSs?

Method

Research design

To investigate the research questions, a quasi-experimental design was taken in this study with a pretest-treatment-posttest-delayed posttest structure using intact EFL classrooms. There was one between-group

factor: the type of pedagogical intervention with three layers of Explicit Instruction + Input Enhancement, input flood, Gap-fill tasks. The dependent variables consisted of measures of productive and receptive knowledge of FSs.

Participants

One hundred ten (n = 110) students taking EFL courses in a private Language Institute in Tehran participated in the study. They were both male and female learners with the age ranges from 19-38. They had already taken an English language proficiency test as a prerequisite attending the classes. Three intact classes were considered as four groups: A) Explicit Instruction + Input Enhancement group, B) Input flood group, and C) Gap-fill group.

Procedure

The treatment spanned a period of eight weeks in courses which were planned to prepare IELTS candidates for their test. The participants in three intact classes were considered as three groups, namely Explicit Instruction + Input Enhancement, input flood, and Gap-fill. A week before the initiation of the treatments, the participating students completed the pretests: productive knowledge test and receptive knowledge test.

The treatments comprised teaching of FSs from the AFL list. Students were briefed about how learning sequences would improve their language performance. Lesson plans included the instruction of target FSs. These instructions were given in increments of 15 to 20 minutes in each class. In all of the treatment groups focus on the target FSs was achieved in addition to other vocabulary activities. Focus on target FSs was achieved be means of meaningful contexts. This was done in view of the necessary psychological processes involved in successful vocabulary learning i.e., "noticing, producing, and generating" (Nation, 2001). The activities introduced aimed to develop the receptive knowledge of students first and then to enhance their FSs productive knowledge.

Instruction for the first treatment, i.e., Explicit Instruction +Input Enhancement, consisted of students reading the passage and answering several comprehension questions. Then, similar to what Bishop (2004) did, the meaning of the FSs and the overall significance of FSs were explicitly explained to the students. To draw maximum attention, all target FSs were bolded and highlighted.

In the second treatment group, i.e., the Input Flood group, the target FSs were untouched, though the text was the same as the one used for the first treatment group. This was similar to what was used in Szudarski and Carter (2016). To understand the role of repetition, 10 FSs in each passage occurred only once and another 10 FSs occurred twice.

Collaborative Gap-fill tasks were introduced to the third treatment group. These tasks were used after the regular reading comprehension questions. Having read the passage first and answered all the comprehension questions, the students were asked to work in pairs and do the gap-fill exercise. Here, a cloze format of the original passage was used. The blanks were the target FSs. Given a word bank, students were asked to collaboratively work on the exercise and fill all the gaps.

As indicated earlier, a pre-test was administered one week prior to the initiation of the treatment to help researchers make sure the target FSs were unfamiliar to the students. After the treatment sessions were finished the immediate posttests were completed: productive knowledge test, receptive knowledge test. As the study also aimed to investigate the long-term learning gains, the delayed post-tests were given after 2 weeks.

Instrumentation

Target formulaic sequences

Following Čolović-Marković (2012) and Youngblood (2014), this study used a sample of formulaic language as identified by the academic sub-list of the Academic Formulas List (Simpson-Vlach & Ellis, 2010). The Academic Formulas List (AFL) identifies the most common and most salient FSs used in academic language from a corpus of 5 million words.

Simpson-Vlach and Ellis used a multiple regression to determine the ranking of sequences on the AFL that accounts for both frequency of occurrence and native speakers' intuitions regarding the strength of a sequence's meaning and form. The expanded AFL sub-list found in the appendix of the 2010 article was used to select target sequences. The list contained 200 FSs.

The criteria for target FSs selection were two-fold: the FSs chosen were the ones believed to be useful to the students and present in the course materials. To meet the criterion of relevance and usefulness, the FSs were chosen from the reading passages that the students had studied before.

Instructional materials

As mentioned before there were three treatment groups in this study namely, Explicit Instruction + Input Enhancement, input flood group, and Gap-fill group. For these groups, several reading passages were provided together with several comprehension questions. The first group had texts in which the goal FSs were bolded and highlighted. However, for the other two groups, the target FSs were not emphasized in any way. Each passage contained 10 FSs which occurred once and 10 other FSs which occurred twice. As for the Gap-fill group, some gap-fill exercises were designed based on the reading passage. After reading and answering comprehension questions, the students were asked to do the gap-fill exercise. The gap-fill task was similar to the one used in Jones and Haywood's (2004) and Nguyen (2014) and Nguyen and Larsen-Freeman (2018).

Language proficiency test

In order to check the English proficiency of the students, a practice version of the TOEFL PBT was used. TOEFL PBT includes three sections: listening, structure and written expression, and vocabulary and reading. This test was selected because it is easy to administer and easy to score objectively. Thus, the selection of this test seemed to be reasonable and suitable for this study.

Productive knowledge test

As it was previously discussed, meaning, form, and use are the three different aspects of vocabulary knowledge. It was also mentioned that vocabulary knowledge should be determined at both receptive and productive levels. In this study, to measure productive knowledge of FSs, the tasks used were in C-test format, similar to the ones used in Jones and Haywood (2004). In this test, the context was not changed in any way, yet a blank was inserted in the place of the any content word in the target FSs. The initial letters of the words intended were provided to help reduce the possible words for each blank. This test aimed to determine whether the students could produce the appropriate FS considering the context in which it was used, irrespective of their capability in determining the appropriate meaning. Thus, the participants were given the meaning of the formulaic sequences in the margin of the test, and were asked to produce the FSs that best fit the blank considering the meaning and the context.

Knowledge of productive vocabulary has been divided into controlled and free by Laufer (1998). If there is a cue, the knowledge of productive vocabulary is called controlled, while free productive vocabulary knowledge means that the user can put the items into use without any help provided.

Receptive knowledge test

For the receptive knowledge test of FSs, the students had to choose an item from the four options in a multiple-choice test format that was appropriate to fill the gap. The distractors were intentionally written in a way that they had most similarity to the correct answer in form, length and meaning. To prevent a haphazard guess at the correct choice, a fifth option (I don't know) was included.

Data Analysis

Using SPSS, the researchers conducted descriptive and inferential statistical calculations. To begin, descriptive statistics for each of the productive knowledge tests and receptive knowledge tests were run in the three testing phases for the Explicit Instruction + Input Enhancement, input flood, and Gap-fill. Then, to make sure the

assumptions of normality, linearity, and homogeneity of variances were respected, preliminary checks were conducted.

Afterwards, the scores gained from the three pedagogical interventions, pretest, posttest, and delayed posttest in the three groups underwent a series of Analysis of Covariances (ANCOVAs) to examine between-group changes at the immediate and delayed posttests. In addition, the developments were analyzed using a series of repeated-measures ANOVAs with time as the within-group variable. Following that, in order to accurately mark the points in time when the three groups showed differences, Least Significant Difference (LSD) post hoc tests were used whenever a significant effect was identified. It was anticipated that effect sizes were needed to be analyzed to help contextualize the test results. Therefore, Partial Eta Squared was calculated to measure the effect sizes.

Results

This study sought to investigate the effects of Explicit Instruction + Input Enhancement, Input flood, and Gap-fill on learners' receptive and productive knowledge of target FSs. As indicated earlier, three null hypotheses were formulated. The results related to each one will be reported in this section separately.

Results of the receptive knowledge tests

Table 1 presents the descriptive statistics for receptive knowledge of target FSs scores derived from the receptive knowledge tests in the three testing times (i.e., pretest, immediate posttest, and delayed posttest) for the EI+IE, IF, and GF groups.

Table 1

Descriptive statistics of the receptive knowledge of target FSs

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Pre_Receptive	EI+IE	35	11.91	3.239	.548	10.80	13.03	5	18

	GF	36	11.75	3.166	.528	10.68	12.82	5	17
	IF	39	11.46	2.694	.431	10.59	12.33	6	16
	Total	110	11.70	3.009	.287	11.13	12.27	5	18
Post-Receptive	EI+IE	35	13.77	2.961	.501	12.75	14.79	5	19
	GF	36	14.17	3.066	.511	13.13	15.20	8	19
	IF	39	11.74	3.747	.600	10.53	12.96	6	18
	Total	110	13.18	3.438	.328	12.53	13.83	5	19
Delayed-Receptive	EI+IE	35	12.94	2.879	.487	11.95	13.93	6	19
	GF	36	13.50	3.066	.511	12.46	14.54	7	18
	IF	39	11.64	3.082	.494	10.64	12.64	6	19
	Total	110	12.66	3.090	.295	12.08	13.25	6	19

Table ۱ showed that pretest scores were not equivalent for the three groups. Figure 1 shows the differences in findings more clearly. In addition, Table 1 showed that the mean scores of the immediate and delayed posttests for GF group were larger than those of the posttests for the IF and EI+IE groups. Yet, it was not clear to what extent these differences were due to the difference in the pretest scores. Thus, holding the pretest scores constant, the researchers ran a series of ANCOVAs to check whether or not there was a significant difference between the posttest scores. Table 2 reports the adjusted means of posttests.

Table 2

Descriptive statistics of the adjusted posttests of receptive knowledge of target FSs

			Std.	95% Confidence Interval	
Dependent Variable	Group	Mean	Error	Lower Bound	Upper Bound
Post_Receptive	EI+IE	13.623[a]	.432	12.767	14.480
	GF	14.132[a]	.426	13.288	14.976
	IF	11.908[a]	.409	11.097	12.720
Delayed_Receptive	EI+IE	12.803[a]	.387	12.036	13.571
	GF	13.467[a]	.382	12.711	14.224
	IF	11.796[a]	.367	11.069	12.524

a. Covariates appearing in the model are evaluated at the following values: Pre_Receptive = 11.70.

Table 2 reported that the adjusted means of the posttests were greater in both EI+IE and GF groups than in the IF group, suggesting that these two treatments resulted in more receptive knowledge of target FSs. However, it was necessary to examine the significance of these differences, which the following ANCOVA table did.

Table 3

ANCOVAs of the receptive knowledge of target FSs

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Post_Receptive	Contrast	102.290	2	51.145	7.845	.001	.129
	Error	691.088	106	6.520			
Delayed_Receptive	Contrast	53.177	2	26.589	5.073	.008	.087
	Error	555.528	106	5.241			

The F tests the effect of Group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

The results of the ANCOVAs, illustrated in Table 3, revealed that, after adjusting for pretest scores, the differences between the three groups at Time 2 and Time 3 (i.e., immediate and delayed posttests) were statistically significant. To exactly specify the points in time where differences between the groups occurred, post hoc was used with LSD adjustment, which is presented in Table 4.

Table 4

Post-hoc between-group comparisons of the receptive knowledge of target FSs

Pairwise Comparisons

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
Post_Receptive	EI+IE	GF	-.509	.606	.403	-1.711	.693
		IF	1.715*	.596	.005	.534	2.896
	GF	EI+IE	.509	.606	.403	-.693	1.711
		IF	2.224*	.591	.000	1.053	3.395
	IF	EI+IE	-1.715*	.596	.005	-2.896	-.534
		GF	-2.224*	.591	.000	-3.395	-1.053
Delayed_Receptive	EI+IE	GF	-.664	.544	.225	-1.742	.414
		IF	1.007	.534	.062	-.052	2.066
	GF	EI+IE	.664	.544	.225	-.414	1.742
		IF	1.671*	.530	.002	.621	2.721
	IF	EI+IE	-1.007	.534	.062	-2.066	.052
		GF	-1.671*	.530	.002	-2.721	-.621

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

As depicted in Table 4, post-hoc between-group comparisons of the receptive knowledge of target FSs for the immediate posttests revealed that there was a significant difference between the IF and the EI+IE and GF groups while the difference between EI+IE and GF groups did not reach significance ($p = .403$, $p > .05$). As for the delayed posttests, only the GF group significantly outperformed the IF group. These results suggested that both EI+IE and GF groups significantly outperformed the IF group at the immediate posttests.

In the next step, in order to examine the development of the receptive knowledge of target FSs through the three testing periods, a series of repeated measures ANOVAs were administered with time (1,

2, and 3) as the within-group variable. Table 5 presents the results of three repeated measures ANOVAs (i.e., one ANOVA for each group).

Table 5

Repeated measures ANOVAs of the receptive knowledge of target FSs

Group	Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
EI+IE	Time	Pillai's Trace	.418	11.839[b]	2.000	33.000	.000	.418
		Wilks' Lambda	.582	11.839[b]	2.000	33.000	.000	.418
		Hotelling's Trace	.717	11.839[b]	2.000	33.000	.000	.418
		Roy's Largest Root	.717	11.839[b]	2.000	33.000	.000	.418
GF	Time	Pillai's Trace	.377	10.293[b]	2.000	34.000	.000	.377
		Wilks' Lambda	.623	10.293[b]	2.000	34.000	.000	.377
		Hotelling's Trace	.605	10.293[b]	2.000	34.000	.000	.377
		Roy's Largest Root	.605	10.293[b]	2.000	34.000	.000	.377
IF	Time	Pillai's Trace	.018	.348[b]	2.000	37.000	.709	.018
		Wilks' Lambda	.982	.348[b]	2.000	37.000	.709	.018
		Hotelling's Trace	.019	.348[b]	2.000	37.000	.709	.018
		Roy's Largest Root	.019	.348[b]	2.000	37.000	.709	.018

a. Design: Intercept
Within Subjects Design: Time
b. Exact statistic

As shown in Table 5, repeated measures ANOVAs showed that there was a statistically significant difference between the three administrations of the receptive knowledge tests in both the EI+IE group, Wilks' Lambda = .582, $F = 11.839$, $p < .001$, and the GF group,

Wilks' Lambda = .623, $F = 10.293$, $p < .001$. Whereas, Table 5 indicated no significant differences across time within the IF group.

In order to locate the significant differences between the three testing periods in the EI+IE and GF groups, LSD post-hoc within-group comparisons were run (see Table 6).

Table 6

Post-hoc within-group comparisons of the receptive knowledge of target FSs

						95% Confidence Interval for Difference[b]	
Group	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
EI+IE	1	2	-1.857*	.376	.000	-2.621	-1.093
		3	-1.029*	.484	.041	-2.013	-.045
	2	1	1.857*	.376	.000	1.093	2.621
		3	.829	.474	.089	-.134	1.791
	3	1	1.029*	.484	.041	.045	2.013
		2	-.829	.474	.089	-1.791	.134
GF	1	2	-2.417*	.532	.000	-3.497	-1.336
		3	-1.750*	.462	.001	-2.688	-.812
	2	1	2.417*	.532	.000	1.336	3.497
		3	.667	.378	.086	-.101	1.434
	3	1	1.750*	.462	.001	.812	2.688
		2	-.667	.378	.086	-1.434	.101
IF	1	2	-.282	.419	.505	-1.130	.566
		3	-.179	.294	.545	-.774	.415
	2	1	.282	.419	.505	-.566	1.130
		3	.103	.472	.829	-.852	1.057
	3	1	.179	.294	.545	-.415	.774
		2	-.103	.472	.829	-1.057	.852

Based on estimated marginal means

*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Within group comparisons in Table 6 showed that both EI+IE and GF groups significantly improved from pretest to posttest and from pretest to delayed posttest ($p < .001$). Yet, the difference between immediate and delayed posttests did not reach significance in these two groups (EI+IE, $p = .089$; GF, $p = .086$).

All in all, the findings with regard to the receptive knowledge of target FSs indicated that although Input Flood could not promote learners' performance, both the Explicit Instruction + Input Enhancement and the Gap-fill treatments improved learners' receptive knowledge of target FSs from pretests to posttests and retained the effects until the delayed posttests. Additionally, Explicit Instruction + Input Enhancement group performed better than the Gap-fill group at both the immediate and delayed posttests; however, these differences were not statistically significant. Therefore, the first null hypothesis was rejected.

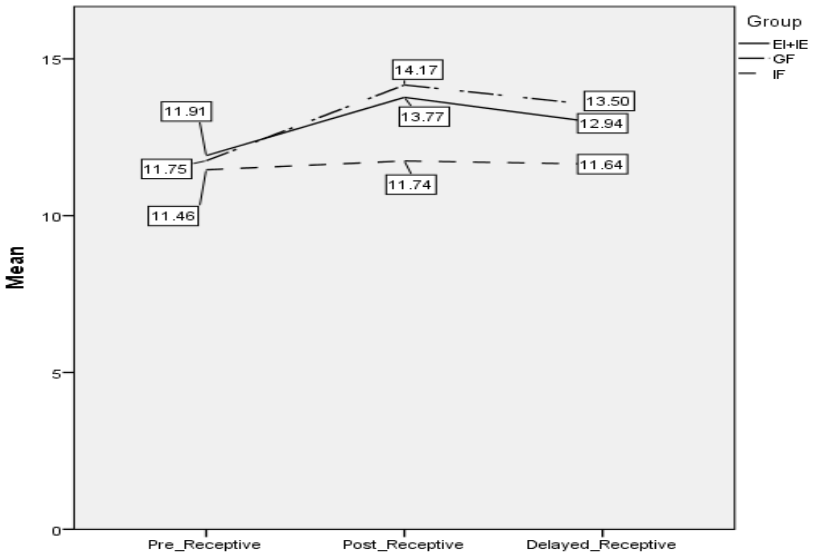

Figure 1. *Receptive knowledge of target FSs*

Results of the productive knowledge tests

The second research question addressed the effects of Explicit Instruction + Input Enhancement, Input flood, and Gap-fill on learners' productive knowledge of target FSs. To investigate the second research question, posttest, and delayed posttest scores were subjected to ANCOVAs, with the pretest scores being the covariate. Then, three separate repeated measures ANOVAs within each group were run. The descriptive statistics for the three groups at the three different testing periods are demonstrated in Table 7. Additionally, Figure 2 illustrates the variations in the scores for the three groups over the three testing periods.

Table 7

Descriptive statistics of the productive knowledge of target FSs

					95% Confidence Interval for Mean	
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
Pre_Productive	EI+IE	35	14.24	4.022	.680	12.86	15.62
	GF	36	13.74	4.312	.719	12.28	15.19
	IF	39	14.63	4.121	.660	13.30	15.97
	Total	110	14.21	4.132	.394	13.43	14.99
Post_Productive	EI+IE	35	19.86	4.941	.835	18.16	21.55
	GF	36	17.89	5.921	.987	15.89	19.90
	IF	39	15.30	4.635	.742	13.80	16.80
	Total	110	17.60	5.469	.521	16.56	18.63
Delayed_Productive	EI+IE	35	18.83	3.781	.639	17.53	20.12
	GF	36	17.37	6.868	1.145	15.04	19.69
	IF	39	14.68	4.376	.701	13.26	16.10
	Total	110	16.88	5.413	.516	15.86	17.90

The descriptive statistics of pretest and posttests of productive knowledge with respect to the three groups are presented in Table 7. As shown in this table, the mean scores for the posttests are greater than

the mean scores of pretests in the three experimental groups. In addition, the mean score of the delayed posttest (M = 14.68) in the IF group was somewhat the same as its pretest (M = 14.63). Also, the mean score of the IF group was smaller than that of the other two groups at the immediate and delayed posttests (see Figure 2). Yet, it was not clear to what extent these differences were due to the difference in the pretest scores. Thus, holding the pretest scores constant, the researchers ran a series of ANCOVAs to check whether or not there was a significant difference between the posttest scores. Table 8 reports the adjusted means of posttests.

Table 8

Descriptive statistics of the adjusted posttests of productive knowledge of target FSs

			Std.	95% Confidence Interval	
Dependent Variable	Group	Mean	Error	Lower Bound	Upper Bound
Post_Productive	EI+IE	19.833[a]	.575	18.692	20.973
	GF	18.345[a]	.568	17.218	19.472
	IF	14.904[a]	.546	13.822	15.986
Delayed_Productive	EI+IE	18.804[a]	.633	17.550	20.058
	GF	17.779[a]	.625	16.540	19.019
	IF	14.320[a]	.600	13.130	15.510

a. Covariates appearing in the model are evaluated at the following values: Pre_Productive = 14.21.

Table 9

ANCOVAs of the productive knowledge of target FSs

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Post_Productive	Contrast	476.280	2	238.140	20.563	.000	.280
	Error	1227.602	106	11.581			

Delayed_Productive	Contrast	412.702	2	206.351	14.736.000 .218
	Error	1484.292	106	14.003	

The F tests the effect of Group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

As reported in Table 8, the adjusted posttest mean scores for the IF group were smaller than those of the EI+IE and GF groups at both posttests. Also, the results of the ANCOVA, illustrated in Table 9, showed that the difference between the groups was statistically significant at both immediate, $F = 20.56$, $p < .001$, and delayed posttests, $F = 14.74$, $p < .001$. Consequently, post-hoc tests were performed on both posttests.

Table 10

Post-hoc between-group comparisons of the productive knowledge of target FSs

						95% Confidence Interval for Difference[b]	
Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
Post_Productive	EI+IE	GF	1.488	.809	.069	-.116	3.091
		IF	4.929*	.793	.000	3.356	6.501
	GF	EI+IE	-1.488	.809	.069	-3.091	.116
		IF	3.441*	.790	.000	1.875	5.007
	IF	EI+IE	-4.929*	.793	.000	-6.501	-3.356
		GF	-3.441*	.790	.000	-5.007	-1.875
Delayed_Productive	EI+IE	GF	1.025	.889	.252	-.738	2.788
		IF	4.485*	.872	.000	2.756	6.213
	GF	EI+IE	-1.025	.889	.252	-2.788	.738
		IF	3.460*	.868	.000	1.738	5.181
	IF	EI+IE	-4.485*	.872	.000	-6.213	-2.756
		GF	-3.460*	.868	.000	-5.181	-1.738

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The post-hoc contrasts, reported in Table 10, showed that at both the immediate and delayed posttests, the EI+IE and GF groups significantly outperformed the IF group. This analysis showed no other significant group differences at the two posttests. Therefore, the results indicated that productive knowledge scores gained by the EI+IE and GF groups were significantly better than those in the IF group at both Time 2 and 3.

Furthermore, to examine the development of the productive knowledge scores through the three testing periods, a series of repeated measures ANOVAs were run within each group.

Table 11
Repeated measures ANOVAs of the productive knowledge of target FSs

Group	Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
EI+IE	Time	Pillai's Trace	.924	199.687[b]	2.000	33.000	.000	.924
		Wilks' Lambda	.076	199.687[b]	2.000	33.000	.000	.924
		Hotelling's Trace	12.102	199.687[b]	2.000	33.000	.000	.924
		Roy's Largest Root	12.102	199.687[b]	2.000	33.000	.000	.924
GF	Time	Pillai's Trace	.619	27.648[b]	2.000	34.000	.000	.619
		Wilks' Lambda	.381	27.648[b]	2.000	34.000	.000	.619

		Hotelling's Trace	1.626	27.648[b]	2.000	34.000.000	.619
		Roy's Largest Root	1.626	27.648[b]	2.000	34.000.000	.619
IF	Time	Pillai's Trace	.023	.431[b]	2.000	37.000.653	.023
		Wilks' Lambda	.977	.431[b]	2.000	37.000.653	.023
		Hotelling's Trace	.023	.431[b]	2.000	37.000.653	.023
		Roy's Largest Root	.023	.431[b]	2.000	37.000.653	.023

a. Design: Intercept
Within Subjects Design: Time
b. Exact statistic

As can be seen in Table 11, repeated measures ANOVAs showed a significant effect for time only in the EI+IE group (Wilks' Lambda = .076, F = 199.687, p < .001) and GF group (Wilks' Lambda = .381, F = 27.648, p < .001). Moreover, Table 11 indicated no significant differences across time within the IF group. Therefore, to exactly specify the point in time where differences arose in the EI+IE and GF groups, post-hoc within-group comparisons were administered.

Table 12

Post-hoc within-group comparisons of the productive knowledge of target FSs

						95% Confidence Interval for Difference[b]	
Group	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
EI+IE	1	2	-5.617*	.280	.000	-6.186	-5.048

		3	-4.587*	.563	.000	-5.732	-3.443
	2	1	5.617*	.280	.000	5.048	6.186
		3	1.030	.560	.075	-.108	2.168
	3	1	4.587*	.563	.000	3.443	5.732
		2	-1.030	.560	.075	-2.168	.108
GF	1	2	-4.157*	.555	.000	-5.284	-3.031
		3	-3.630*	.850	.000	-5.356	-1.904
	2	1	4.157*	.555	.000	3.031	5.284
		3	.528	.639	.415	-.769	1.824
	3	1	3.630*	.850	.000	1.904	5.356
		2	-.528	.639	.415	-1.824	.769
IF	1	2	-.666	.712	.355	-2.108	.776
		3	-.049	.394	.902	-.847	.749
	2	1	.666	.712	.355	-.776	2.108
		3	.618	.730	.403	-.859	2.094
	3	1	.049	.394	.902	-.749	.847
		2	-.618	.730	.403	-2.094	.859

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

As indicated in Table 12, within-group comparisons with LSD adjustments revealed significant improvements from pretest to posttest and also from pretest to delayed posttest in the EI+IE and GF groups ($p < .001$). In addition, these groups did not manifest any significant gains from immediate to delayed tests ($p > .05$). These results indicated that both EI+IE and GF group improved significantly from pretest to posttest and retained the gains from posttest to delayed posttest (see Figure 2).

Therefore, findings regarding the productive knowledge of target FSs suggested that the EI+IE and the GF groups outperformed the IF group at Times 2 and 3. Also, learners in the EI+IE and the GF

groups had significantly gains in their productive knowledge from pretest to posttest and also from pretest to delayed posttest, meaning that both EI+IE and GF were successful in raising productive knowledge of target FSs. Thus, the second null hypothesis stating that Explicit Instruction + Input Enhancement, Input flood, and Gap-fill do not have any effects on Iranian EFL learners' productive knowledge of target FSs. was rejected in terms of the positive effect of Explicit Instruction + Input Enhancement and Gap-fill tasks.

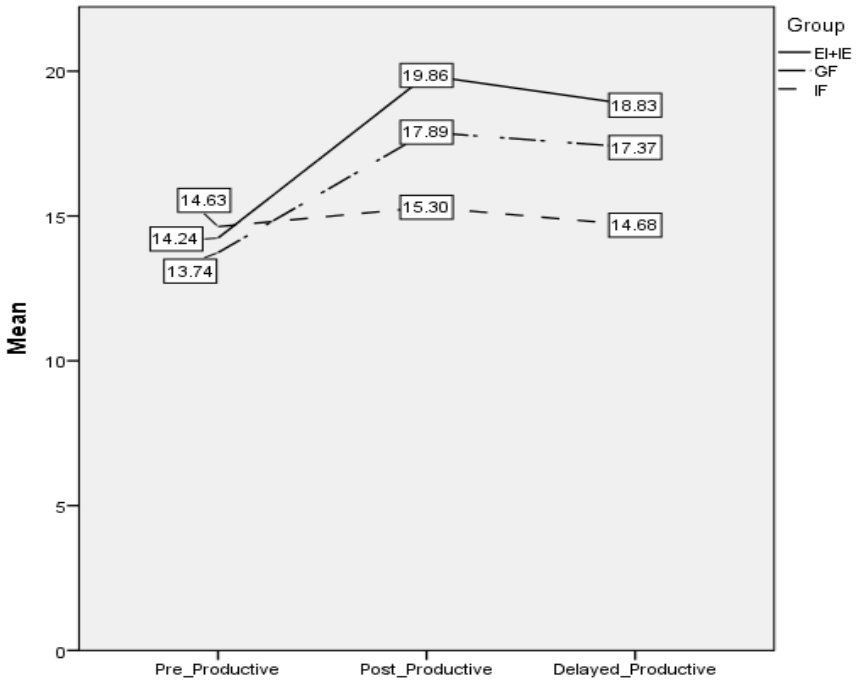

Figure 2. *Productive knowledge of target FSs*

Discussion

Findings with regard to both receptive and productive knowledge of target FSs indicated that while Input Flood could not promote learners' performance, both the EI+IE and the GF could improve learners' receptive and productive knowledge of target FSs from pretests to posttests and retained the effects until the delayed posttests. Additionally, both EI+IE and GF groups significantly outperformed the IF group at the immediate posttests. However, as for the receptive

knowledge delayed posttest, only the GF group significantly outperform the IF. Moreover, considering the receptive knowledge tests, the mean score of the GF group was greater than that of EI+IE group at both posttests; however, this difference did not reach statistical significance.

One way to account for the GF group's success was to attribute this to the learners' exposure to the context of FSs, which – in the long run – contributes to better mastery of form in comparison with direct explanation of meaning (IE+EI). During the GF exercise, participants read the passage a second time, but with blanks. They then tried to understand the context around the blanks to choose a FS that would semantically fill the gaps best. The primary focus is on meaning in this process and learners probably benefitted from it in understanding the sense of the whole passage, which could, in turn, help them understand the meaning of those FSs that they used in gaps. Incidentally, the form of FSs was focused on, which is a manifestation of focus on form. Despite the incidental nature of focus in this meaning-making process, it proved effective. This is compatible with Long's (1991) theory of focus-on-form instruction. It also lends support to previous research on task-based vocabulary teaching (e.g., Ellis, Tanaka, & Yamazaki, 1994; Kim, 2008; Loewen & Philp, 2006), all of which show that incidental focus on form was effective once emphasis of the task was primarily on meaning.

In general, the success of the GF group in the receptive test shows that processing higher cognitive and motivational levels in processing meaning and usage helped retaining the form, which can be deduced from this group's significant improvement in the receptive knowledge. The same holds true for the productive knowledge. Significant improvement in theproductive knowledge shows that producing the form is easier in contexts that require it.

On the other hand, results of the productive knowledge tests indicated that the EI+IE group worked better in helping participants to learn the form of the taught FSs and also the EI+IE group scored the highest in the Productive Knowledge tests. These results suggest that

the IE+EI treatment was more effective than GF in improving learner's productive knowledge of FSs. However, with regard to receptive knowledge of FSs, IE+EI was not the most conducive type of instruction. This is in line with Nation's idea that when a classroom activity assists in acquiring new FSs' form, it will help learners' acquisition of Productive Knowledge (2001). As explained by Nation, one reason that productive knowledge of lexical items exerts a bigger challenge, compared with receptive knowledge, is because L2 lexical items are usually notably different from those in L1. Thus, it is more difficult for learners to produce lexical items because they demand a precise knowledge of the form. This might be the reason as to why GF was not the group with the highest score in the Productive Knowledge test as it was previously for the receptive knowledge.

Another possible reason for higher scores in the EI+IE group can be attributed to the fact that in the other two groups, learners were mentally engaged in doing the task and were only aware of the meaning of these FSs later. Yet, because form-meaning connection was not established as learners needed to complete the task, no higher ability in producing the FSs was seen. This supports Schmitt's (2008) claim that when a form-meaning link of new L2 lexical items (as in EI+IE in this study) is created early on, vocabulary instruction is more successful because it draws on more cognitive resources.

With regard to production, it has been proved that attention to the context of new FSs plays a significant role. Pickering's study (1982) examined the effectiveness of contextualized versus de-contextualized (i.e. translation into L1) presentation of new words. It was illustrated that when new items are presented in context, there are better gains in learning. In the EI+IE group of the current study, target FSs were taught by the instructor (EI) and also introduced in context (IE) which demanded that the learners pay closer attention to the context. Therefore, EI+IE was shown to be most effective in aiding learners to productively remember these FSs in the immediate and delayed post-tests.

The findings also confirm the evidence on effects of explicit instruction on both single words (e.g., Laufer, 2006; Webb, 2007) and

formulaic sequences (e.g., Alali & Schmitt, 2012; Peters, 2014; Webb & Kagimoto, 2011). They are also in line with the findings of Schmitt et al. (2004) supporting the incorporation of explicit teaching of FSs in EFL/ESL classes. In addition, the findings of Dörnyei's (2009) are also substantiated. He strongly advocated the explicit teaching of FSs in instructed SLA.

The study results are also congruent with previous research which suggested that teaching formulaic sequences explicitly or making them salient in input can facilitate their acquisition and internalization. For example, AlHassan (2018), AlHassan and Wood (2015), Boers et al. (2006), Byrd and Coxhead (2010), Nesselhauf (2003), and Wood (2009) contend that focused instruction of formulaic sequences is likely to increase the chances of acquiring formulaic sequences. Other scholars (e.g. Bishop, 2004a, 2004b; Cortes, 2004, 2006; Ward, 2007; Wood, 2010, 2015) stress the pedagogical efficacy of making formulaic sequences salient in input. On the pedagogical utility of making formulaic sequences salient, Bishop (2004a, 2004b), Erman and Warren (2000), Schmitt and Carter (2004), and Wood (2010) suggest that such an approach may foster L2 learners' noticing of the form and function of formulaic sequences, raise L2 learners' awareness of the importance of utilizing them in their language production, and develop L2 learners' independent learning skills.

With respect to the third group, results of this study indicated that Input Flood could not have any positive effects on neither the productive nor the receptive knowledge of FSs. This is not consistent with previous research which suggested coming across a word several times in input can result in incidental learning of that word in reading (e.g., Pellicer-Sánchez, 2016; Webb, 2007) and in listening (e.g., van Zeeland & Schmitt, 2013; Vidal, 2011). Similarly, our findings about the non-significant effect of Input Flood could not support some other studies on FSs (Durrant & Schmitt, 2010; Pellicer-Sánchez, 2017). In a study on the incidental learning of collocations, Durrant and Schmitt (2010) reported that collocations that appeared in the context twice were recalled more easily than those used only once, providing

evidence that the incidental learning of collocations happens very similarly to incidental learning of vocabulary items. Some studies investigated the effects of incidental learning of collocations in longer stretches of discourse, where the frequency of the target items was higher. One such work was done by Pellicer-Sánchez (2017). The study concluded that adjective-pseudoword collocations which appeared 4 and 8 times in a short story were more easily learned.

Additionally, several scholars (e.g. Conklin & Schmitt, 2012; Cortes, 2006; Ellis, Simpson-Vlach, & Maynard, 2008; Fan, 2009) have cast doubts on the pedagogical efficacy of leaving the acquisition of formulaic sequences to chance encounters. The limited, if any, effectiveness of this approach can be attributed to L2 learners' failure to notice, understand, and acquire formulaic sequences because of their tendency to view language as composed of individual words, their tendency to disregard complex items in input (Boers & Lindstromberg, 2012; Byrd & Coxhead, 2010; Cortes, 2004; Jones & Haywood, 2004; Murray, 2016; Wood, 2010; Wood & Appel, 2014).

The findings of the current study with regard to the non-significant effect of Input Flood suggest that more encounters with FSs does not necessarily yield better results. It is noteworthy that investigations about the role of FFI showed that repetition has positive effects on the acquisition of individual words but only in focus on forms situations (Laufer & Rozovski-Roitblat, 2011). This can be related to the lack of involvement by students in the IF group. According to the Involvement Load Hypothesis (Laufer & Hustijn, 2001), classroom tasks' effectiveness relies heavily on the levels of involvement factors such as: *need, search,* and *evaluation.* In other words, the higher the levels of *need, search* and *evaluation*, the more successful the acquisition of vocabulary. It seems that Input Flood failed to trigger high levels of these cognitive processes. The other two types of treatment, however, appeared to have activated higher levels of *need, search* and *evaluation* since the tasks involved implementational procedures. In this regard, our findings also support Eckerth and Tavakoli (2012) who concluded that the effects of the Involvement Load Hypothesis override the

frequency effect. This lends support to the findings of Hulstijn's (2001), which argues that the acquisition of L2 words is a process comprising several facets which is catalyzed by frequency. Nonetheless, the effect of frequency must be measured along with other aspects that mutually lead to learning. The findings of the current study revealed that the same applies to the acquisition of FSs.

Conclusion

Overall, findings from the study support the effectiveness of using EI+IE and GF in the classroom to facilitate learners' acquisition of FSs and also to retain the target FSs better at both the receptive and the productive level. This finding accords with published research on TBLT, and confirms the usefulness of using tasks in the language classroom to encourage focus on form. In addition, the nonsignificant results related to Input Flood indicated that leaving the acquisition of formulaic sequences to numerous encounters in the input is inadequate and cannot lead to acquisition of those FSs. However, more research needs to be carried out on the advantages of Input Flood, if any, on learning FSs.

An implication drawn from this study is to make more complex the causality between instruction and acquisition. At the group level, instruction and acquisition seem to be in a unidirectional relationship, with instruction being the key variable leading to the success in acquisition. The IE+EI group shows that explicit teaching of strategies to learners in order to raise their awareness of FSs and to notice them in context is well-grounded and worthy of classroom time.

In the current study, using explicit instruction together with input enhancement yielded better results in improving the students' productive knowledge of FSs than their receptive knowledge. The acquisition of FSs entails both productive and receptive aspects, which could go unnoticed if the construct were measured in a generic fashion. Thus it is of great importance to use multiple measures to gauge a learner's command of L2 vocabulary (see Webb 2007; Chen & Truscott, 2010).

This study has several implications, the most striking one being the fact that form-focused instruction facilitates learning of FSs. Teachers can benefit from a whole array of activities in light of the goals and ambitions they nurse. Teachers are highly advised to define goals for their students and then engineer the path towards the goal by implementing the type of activity they deem necessary.

Another message from this piece of research is the conducive effect of using explicit strategy instruction. Such overt teaching of noticing strategies helps learners in identifying FSs, which can gradually work its way into their reading and listening habits. This boosts earner autonomy in the sense that it will eventually obviate the need for instruction and classroom to notice FSs. Learners will automatically realize FSs in context.

The suggestions and conclusions of this study are tentative since our study suffers from a number of limitations. First is the small number of participants. Our experiment was done in a setting where large number of participants could not be accommodated in single classes. This was on the one hand because of small-sized classrooms and on the other, because of the strong tendency of L2 learners nowadays to attend classed with a limited number of participants, believing that such learning environment is more efficient. Second, we collected data from participants of one level of proficiency only, making it hard to generalize the results to learners of different proficiency levels. Also, our instruction period lasted for 8 weeks. It is possible that longer periods of instruction can more accurately investigate the complexities of the acquisition process. Another way the study could be improved is by looking at other types of intervention besides IE+EI, GF, and IF.

Since the results from Input Flood appeared less promising, there is need for more research to address the potential problem of Input Flood where encountering FSs repeatedly may become productive by, for example, increasing the number of encounters or combining it with explicit instruction. Such research can shed light on the beneficial and detrimental effects of Input Flood on different aspects of L2 performance.

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