



# The Journal of Asia TEFL

<http://journal.asiatefl.org/>

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## ZPD-Based Dynamic Assessment and Collaborative L2 Vocabulary Learning

**Azizullah Mirzaei**  
*Shahrekord University, Iran<sup>1</sup>*

**Leila Shakibaei**  
*Shahrekord University, Iran*

**Ali Akbar Jafarpour**  
*Shahrekord University, Iran*

Despite growing interest in the implementation of dynamic assessment in second or foreign language learning research, few studies have attempted to incorporate the notion into real second language classrooms. This study explored the effect of cumulative Group-Dynamic Assessment on depth of vocabulary knowledge in an EFL context. To this end, 50 EFL learners were selected from a junior high school in Iran after administering the Oxford Quick Placement Test. Then, they were randomly assigned to two equal groups, namely, experimental Group-Dynamic Assessment and control Non-Dynamic Assessment. The Group-Dynamic Assessment group was instructed through interactionist cumulative Group-Dynamic Assessment procedures while the control group was taught without providing any cumulative ZPD-sensitive feedback. Before and after the instruction, a vocabulary knowledge scale (Paribakh & Wesche, 1993, 1996) was administered to measure both groups' depth of second language vocabulary knowledge. The split-plot ANOVA results revealed that the implementation of interactionist cumulative Group-Dynamic Assessment helped the learners outperform the Non-Dynamic Assessment group on both immediate and delayed posttests. Additionally, complementary qualitative analysis showed that cumulative Group-Dynamic Assessment had both diagnostic and developmental potentials to contribute not only to individual participants but also to the whole class to increase their depth of vocabulary knowledge. The findings pointed to the use of ZPD-based collaborative frameworks in teaching second language vocabulary in meaningful contexts and thereby helping learners develop deeper word knowledge.

**Keywords:** sociocultural theory, dynamic assessment, group-dynamic assessment, concurrent G-DA, cumulative G-DA, depth of vocabulary knowledge

### Introduction

The salience of vocabulary is not hidden from any perceptive eye. No matter how well a student is familiar with L2 grammar or has mastered L2 sounds, without words to express meanings, he won't achieve much success in communicating through the language in any meaningful way (McCarthy, 1990). From a cognitive perspective, the main source of most breakdowns leading to further negotiation of meaning is lexical rather than morphosyntactic (Foster & Ohta, 2005). Despite the perceived importance

<sup>1</sup> Corresponding author

of teaching L2 vocabulary, especially, in EFL contexts, there is still no generally accepted theory or framework for teaching and learning L2 vocabulary in the most meaningful and effective way (Pavičić Takač, 2008).

One recent approach that has largely impacted the field and that seems useful for teaching L2 vocabulary is Vygotsky-inspired sociocultural theory (SCT). SCT argues that higher-level human cognition has its origins in social life (Lantolf & Thorne, 2006). Offering teachers a framework in order to guide responses to learners' errors (Vygotsky, 1978), SCT basically puts emphasis on the crucial roles of social interaction and culturally constructed artifacts in the organization of human forms of thinking (Lantolf & Thorne, 2006). According to Lantolf and Thorne (2006), one form of mediation is regulation which helps individuals move within their ZPDs in order to make their mental functioning voluntary.

A recent derivation of SCT, which equally seems promising for integrating vocabulary instruction and assessment in L2 classrooms, has been Dynamic Assessment (DA). DA is theoretically framed within Vygotsky's notion of the Zone of Proximal Development (ZPD) defined as "the distance between the child's developmental level as determined by independent problem solving and the higher level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 85). ZPD, accordingly, provides a socially mediated, dynamic framework as well as a highly productive learning space in which real development can take place (van Lier, 2004; Mirzaei & Eslami, 2015). Inspired by similar theoretical premises, DA is, therefore, a kind of dialogic cooperation between learner and mediator that integrates teaching and assessment into a unified activity to promote the learner's development and, at the same time, to assess his or her ZPD (Lantolf & Poehner, 2004). Nonetheless, providing one-to-one, mediator-learner mediation seems to be unfeasible in most classes due to the matter of time, and, consequently, teachers cannot afford mediation to all learners in class (Davin & Donato, 2013). As a solution to this problem, reconsidering the definition of group and ZPD, Group-DA (G-DA) was proposed by Poehner (2009) based on the notion that all students may benefit from instruction and mediation offered to other classmates (van Compernelle & Williams, 2012).

Although several studies have investigated the efficiency of DA in assessing other language skills in Iranian EFL contexts, such as writing (Alavi & Taghizadeh, 2014), reading comprehension (Ajideh & Nourdad, 2012), and interlanguage pragmatics (Tajeddin & Tayebipour, 2012), few of them have focused on learners' development of vocabulary knowledge in L2 classrooms. Therefore, further L2 research is necessary to look into the potentials of cumulative G-DA as a tool to improve L2 learners' depth of vocabulary knowledge in EFL contexts. This study aimed at putting cumulative G-DA proposed by Poehner (2009) to practice in vocabulary classroom contexts to reveal the effect of the framework on enhancing EFL participants' depth of vocabulary knowledge.

## **Theoretical Background**

Vocabulary knowledge involves a number of very different sub-knowledge components (Richards, 1976). It involves knowing the knowledge of word meaning, the knowledge of the spoken and written form, connotative and associational knowledge, collocational knowledge, grammatical knowledge, morphological knowledge, and the knowledge of social or other constraints in use (Nation, 2001).

As to different dimensions of vocabulary knowledge, a related distinction has often been made in research on vocabulary learning: depth of knowledge and size (or breadth) of vocabulary knowledge (Read, 2000). As Nation (2001) states, breadth of vocabulary knowledge refers to the quantity or number of words learners know at a particular level of language proficiency. In fact, the number of words upon which a learner has at least some partial knowledge of meaning in written or spoken discourse is referred to as the vocabulary size, or breadth. As Schmitt (2008) asserts, crucial significance has been attached to vocabulary size of second language learners because it is a key element in oral fluency, good predictor of reading comprehension, and closely correlated with writing quality.

On the other hand, the knowledge about the different aspects of each word, such as pronunciation, spelling, meaning, syntactic, frequency, register, morphological, and collocational properties, is defined as vocabulary quality, or depth of vocabulary knowledge (Henriksen, 1999; Read, 2000). It is well-established in SLA literature that in addition to needing a large number of lexical items, it is also essential for learners to know a great deal about each item so as to apply it well (Schmitt, 2008). Several studies have reported that depth of vocabulary knowledge is so much more important than size of vocabulary knowledge, because it not only is a better predictor of L2 reading comprehension, but also it can make a unique assistance to L2 reading comprehension which cannot be achieved through the vocabulary size (e.g., Qian, 1999, 2000).

SCT, a psychological theory of mind drawn mainly from the seminal works of Lev Vygotsky (1978, 1986), has been recently extended to L2 learning and teaching (Lantolf & Thorne, 2006). Vygotsky suggests that human cognition is constructed through engagement in social activities mediated by various tools (Johnson & Golombek, 2011), the most important of which is language through which individuals establish an indirect or mediated relationship with others (Lantolf, 2000). In other words, language is applied in order to organize not only the individuals' but others' social and mental functioning as well (Vygotsky, 1986). In this regard, learning is a social enterprise which cannot be achieved in isolation; rather, it can be available under social and collaborative interaction (Vygotsky, 1978, 1986). That is, collaboration with others through speech helps learners to co-construct meaning and regulate their thinking. However, co-construction of knowledge develops when learners are working within their ZPDs.

The ZPD notion, as theorized by Vygotsky (1978), refers to an optimal 'ecosystem,' featuring inter-psychological mechanisms dialectically activated within the distance between the 'actual' and 'potential' developmental levels through the learner's collaboration with others, wherein learning can most productively take place (van Lier, 2004; Mirzaei & Eslami, 2015). In this learning space, individual learners with similar 'actual' developmental levels, as estimated by conventional tests, may display multiple 'potential' developmental levels which can be activated and traced by DA frameworks. In fact, by providing learners with mediation attuned to their ZPDs, DA can help teachers diagnose their abilities and begin the process of furthering their development (Poehner, 2009).

As one recent derivation of SCT, DA, developed by Feuerstein in the early 1950s for the purpose of measuring the learning potential of low-performing children (Feuerstein, Rand, & Hoffman, 1979), pays much heed to the learning process rather than the product. Crucially, DA is a kind of dialogic cooperation between a learner and a mediator that integrates teaching and assessment into a unified activity to promote the learner's development and at the same time to assess his or her ZPD (Lantolf & Poehner, 2004). The ultimate goal in DA is not to assess the solo and successful performance of the learner, rather to enhance the learner's future development through getting them involved in the interaction with the mediators (Johnson & Golombek, 2011). Furthermore, it is assumed in DA that the skilled individual is capable of self-regulation or autonomous learning, while the unskilled individual is incapable to do tasks and activities independently. The unskilled individual, then, needs guidance on the part of more skilled individuals to acquire language (other-regulation). In this study, in order to explore the learners' ZPD, a translation task was developed which consisted of 12 sentences including 15 target words. That is, using the recently learned vocabularies, the participants were asked to translate these sentences into English. Their written sentences were used as a means to reveal their level of vocabulary knowledge, and the extent and the kind of mediation which they needed in order to make development and move toward self-regulation.

As one of the earliest SCT-inspired studies, Aljaafreh and Lantolf (1994) proposed graduation, contingency and dialogicity as three main criteria for mediation. According to them, if social mediation is going to be effective, it should primarily be 'graduated' to the learners' developmental level. That is, providing mediation should be started implicitly and gradually becomes more explicit depending on the learners' reaction to the mediation. Contingency of mediation means scaffolded help "should be offered only when it is needed, and withdrawn as soon as the novice shows signs of self-control and ability to function independently" (Aljaafreh & Lantolf, 1994, p. 468). The last criterion for an effective social

mediation is dialogicality, according to which assistance should be provided through dialogues and engaging in collaborative activities.

However, teachers facing classrooms of learners instead of a single learner have found it difficult to apply Vygotsky's notion of ZPD in their teaching (Wegerif & Mercer, 1997). For example, Mercer and Fisher (1997) suggest that application of the ZPD seems limited in the classroom context, because the ZPD puts emphasis on the individual's ZPD, whereas the classroom circumstance requires development of the class or group's ZPD. Accordingly, supposing the whole class to have the same ZPD seems problematic (Mercer & Fisher, 1997).

Regarding the ways that mediators target a group's ZPD, Poehner (2009) draws a distinction between two types of G-DA, namely concurrent and cumulative; in cumulative G-DA, which has been utilized in the current study, a teacher directs all mediation to the same student. That is, when a student faces a problem, she or he is provided with hints and mediations until finding the correct answer (Davin, 2011), and in so doing, the group's ZPD is enriched.

Nevertheless, in the concurrent G-DA, a teacher offers mediation in response to an individual, but the interaction shifts between primary interactants and the secondary interactants (i.e. other members within a group) so as to develop individuals with the aid of the group's ZPD (Poehner, 2009). In fact, the failure of the addressed learner causes other learners who once were considered as secondary participants to be primary interactants and brings them into play (Poehner, 2009).

As an early study, Donato (1994), conducting research on L2 learners of French in the classroom context, studied the effects of collective scaffolding on morphosyntactic and lexical competency in learners. The results of the study revealed that during interaction learners were coincidentally both experts and novices. Tracing the moment-by-moment co-construction of selected utterances, Donato concluded that co-construction, interaction, and social setting of the classroom can enhance language learning in both the individual and group as well.

Similarly, Gibbons (2003) examined the possibility of constructing group ZPD with a group of learners. Gibbons (2003) ran concurrent G-DA in a primary school class of English language learners who were supposed to learn some new words. Analyzing the group performance of L2 learners, Gibbons (2003) argued that the ways students and their teacher co-construct meaning in a shared experience can have a great impact on the students' progress that stretch their ZPD to more complex domains.

Lantolf and Poehner (2010) reported the results of their study on applying cumulative G-DA principles to L2 learners of Spanish in a primary school in the U.S. The results of the study revealed that not only the addressed individuals but also the whole class had become familiar with the grammatical point under study and new vocabulary.

Davin's (2013) study examined collaboration during small group tasks with young novice language learners who were studying Spanish. After 5 days of classroom dynamic assessment (DA) targeting *Wh* question formation, learners worked in small groups on a collaborative writing task in which they were supposed to provide an interview with an international student from Argentina. It was sought to determine whether students were able to mediate their peers during this task and if so, whether this mediation could be traced back to participation in classroom DA. Findings proved that students pooled their knowledge to create lists of *Wh* questions. However, peers helped each other in ways quite different from mediation provided within the DA framework. That is, peer scaffolding led to successful task completion, while DA forms of scaffolding led to conceptual development. Additionally, the findings provided further evidence that scaffolded help is not limited to expert-novice pairings (Swain & Lapkin, 1998). It was concluded that classroom DA is a useful tool for enabling teachers to integrate teaching and assessment and for moving students to conceptual understandings of their new language. However, within the classroom setting in which time is limited, classroom DA may not be enough for the language development of all learners, so other forms of assistance must be applied to provide more individualized collaborative interactions than are not always available in a whole class setting.

Although the effect of DA and G-DA on different skills or sub-skills such as listening, reading, speaking and pronunciation has been investigated (Gagne & Parks, 2013), the empirical research

pertaining to the effect of cumulative G-DA on the depth of vocabulary knowledge is scant. Thus, it is worthwhile to conduct further studies to gain more theoretical and pedagogical insights into this issue.

In an attempt to bridge the gap indicated above, the present study addressed the following research questions:

- 1) Does cumulative G-DA have any significant effect on enhancing long- and short-term gains in depth of vocabulary knowledge of Iranian EFL learners?
- 2) How can cumulative G-DA result in gains in the learners' depth of vocabulary knowledge in terms of transition from other-regulation to self-regulation?

## Method

### Participants

For this study, 50 female learners were selected from a total of 80 junior high-school students (grade one) in southwest Iran (Lorestan Province). They were within the 15-16 age range and attended their EFL classes twice a week, or 4 hours each week. Their L1 was Persian, and based on their performance on the Oxford Quick Placement Test (QPT), they were classified as elementary EFL learners. To put it differently, in order to ensure homogeneity of the participants, students with OPT scores between -1 to +1 SD from the mean were selected and then randomly assigned to two homogeneous groups, namely G-DA as the experimental group, and N-DA as the control group. There were 25 students in each group.

### Instruments

Two instruments were utilized in this study: the QPT and Vocabulary Knowledge Scale (VKS). The paper and pen version of the QPT was used as the primary measure to ensure the homogeneity of the groups in terms of their general language knowledge. This version was used due to its ease of administration. Moreover, the reliability of the test has been reported by some studies around 0.9 for the 60 item and 0.85 for the 40 item test (Geranpayeh, 2003). In the current research, the internal consistency of the test, estimated by Cronbach's alpha coefficient, was found to be 0.86 with the sample.

In addition, in order to measure the students' knowledge of the target words prior and after the instruction, a vocabulary test was developed using the VKS (Paribakht & Wesche, 1996) format. This scale contains five levels from 'no knowledge' to 'knowing how to use the word' accurately in a sentence in English (Nassaji & Tian, 2010). It was selected on the grounds that it has been used for accomplishing similar objectives by other studies (e.g., Nassaji & Tian, 2010; Paribakht & Wesche, 1996). In fact, the target word was presented in a decontextualized manner above the test and the test takers were supposed to self-report their knowledge of the given word. The constructed test was then probed for its validity and reliability. It received expert consultation and judgement in order to ensure both content validity and practicality. The construct validity of the test was analyzed through running factor analysis (Principal Component Analysis). The results yielded satisfactory item loadings on the 15 target words of the test and, thus, supported the use of the instrument for exploring EFL learners' depth of vocabulary knowledge. In addition, the test enjoyed a good reliability estimate ( $\alpha = .84$ ), using Cronbach's alpha.

Furthermore, the study implemented a translation task in order to make the learners use the target words in English sentences. Specifically, learners in both groups were asked to translate the sentences into English so that it could be possible to formulate hypotheses about the participants' developmental levels and at the right time, provide the ZPD participants with appropriate prompts or scaffolding and then compare the posttest results.

## Procedure

In the first session, the QPT was administered to select homogenous participants for the experimental and control groups. In the following session, the test using the VKS was first administered to measure both groups' prior knowledge of the 15 target vocabularies. Then, both groups were taught the target words through similar traditional techniques, that is, reading the words aloud to teach correct pronunciation and using different English sentences, definitions, synonyms, or even Persian equivalents to teach the meanings.

In the third session, the participants in both groups were required to translate 15 Persian sentences into English using the new (English) words as much as possible. The data were then inspected by the teacher to formulate hypotheses about the students' current developmental levels and plan for the subsequent mediation of the students' self-regulations.

For the next five sessions, the main instructional phase was conducted. The instruction for the experimental group included interactionist cumulative G-DA by providing the learners with the necessary mediation attuned to their hypothetical ZPD levels, ranging from the most implicit hints and prompts to the most explicit ones (Aljaafreh & Lantolf, 1994). The goal was to help the ZPD learners notice and correct the erroneous parts of their sentences, thereby facilitating their transition from other-regulation to self-regulation.

The instruction for the control group, however, was in the form of direct, explicit correction of students' errors, indiscriminately, without considering their relevant ZPD levels. In other words, this phase comprised writing students' wrong sentences on the board, explicitly noting the erroneous parts, and then fixing them directly without providing any step by step scaffolding like in G-DA. This instructional phase for both groups lasted for five sessions, and each session, three sentences were handled, in one group with their ZPDs activated but not in the other. The immediate posttests were administered to the both groups at the end of the eighth session. Finally, in the ninth session, two weeks after the immediate posttest, the delayed posttest was administered.

## Results

### Gains in Depth of L2 Vocabulary

Descriptive statistics were computed in order to obtain estimates of the groups' vocabulary achievements on both immediate and delayed posttests and also ensure the normality assumptions of the test scores. The descriptive statistics are displayed in Table 1 below.

TABLE 1  
*Descriptive Statistics for Groups' Pretest-Posttest Scores*

Group	Test	<i>N</i>	Min	Max	Mean	<i>SD</i>	Skewness	Kurtosis
G-DA	Pretest	25	11	31	17.56	5.46	1.29	.95
	Posttest 1	25	30	50	41.68	7.05	-.36	1.37
	Posttest 2	25	29	49	37.68	6.81	-.07	-.85
N-DA	Pretest	25	13	25	17.44	2.94	.97	1.08
	Posttest 1	25	20	38	29.08	5.35	.25	-.62
	Posttest 2	25	17	40	27.12	6.14	.52	-.06

*Note.* The total number score was 5 (VKS maximum level)  $\times$  15 (number of vocabulary items) = 75

As seen in Table 1, the Kurtosis and Skewness values of the participants' scores on both pretests and immediate and delayed posttests were well within the range of  $\pm 1.5$ , which points to the normal distribution of the data. Regarding the pretest scores, the means were roughly the same, 17.56, for the G-

DA group, and 17.44, for the N-DA group, respectively. However, for the groups' posttests (immediate and delayed) scores, the difference between their mean scores looked rather large, which were submitted to further statistical analysis.

Therefore, to measure the effect of cumulative G-DA on L2 students' lexical achievement, a split-plot ANOVA (SPANOVA) was conducted to uncover whether there was any significant development (in the students' depth of vocabulary knowledge) taking place from the pretest to the posttest time within any of the groups. According to Pallant (2007), this statistical technique is an extension to the repeated measures ANOVA, where an independent, between-subjects variable is added to the design already having a within-subjects variable.

SPANOVA assumptions such as, homogeneity of variances and inter-correlations were initially checked. As there was no violation of these assumptions, a SPANOVA analysis was performed for the two groups across the three points in time (pretests and two posttests). As the table of Multivariate Tests of significant (Table 2) illustrates, there was a significant interaction between *time* and *group* variables, Wilks' Lambda = .497,  $F(2, 47) = 23.807$ ,  $p = 0.000$ , partial eta squared = .503. It can be inferred that significant over-time mean differences between the groups' (i.e., G-DA and N-DA) occurred at some points in time (i.e., from pretest to immediate posttest, or to delayed posttest).

TABLE 2  
*Summary of Multivariate Tests for the Groups*

effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
time * group Wilks' Lambda	.497	23.807 <sup>a</sup>	2.000	47.000	.000	.503

In order to examine at what time the groups' over-time mean differences were significant, whether the instruction was effective at all, and how enduring the effects were, a set of Bonferroni-adjusted pairwise comparisons was run.

TABLE 3  
*Pairwise Comparisons for Different Groups*

(I) time -- (J) time	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
				Lower Bound	Upper Bound
1 -- 2	-17.88*	.90	.000	-20.11	-15.64
2 -- 3	2.98*	.49	.000	1.74	4.21
1 -- 3	-14.90*	.94	.000	-17.23	-12.56

As it is demonstrated in Table 3, the mean differences at time 2 and time 3 were significant as compared to time 1, showing increase in gains in depth of vocabulary knowledge, in favor of the G-DA group, despite the rather noticeable decrease from time 2 to time 3. Figure 1 below depicts the process more clearly.

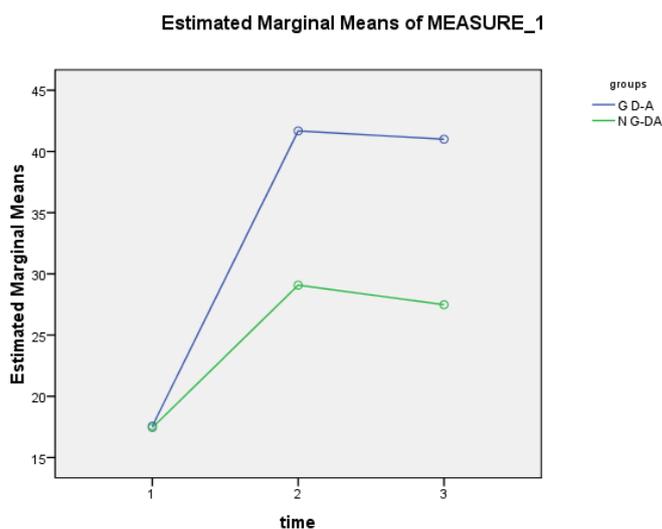


Figure 1. Interaction plot for the groups' gains in depth of vocabulary knowledge

As displayed in Figure 1, both groups made varying degrees of vocabulary achievements from the pretest to the immediate and delayed posttests, sequentially. A closer look at the figure indicates that cumulative G-DA led to considerably greater gains in depth of L2 vocabulary knowledge than N-DA instruction, not only in the immediate posttest (short-term gains) but in the delayed posttest (long-term gains). In other words, despite some delayed posttest decrease in the vocabulary knowledge scores of the participants, the favorable effects of G-DA still remained in place on their depth of vocabulary knowledge over time. A similar, though inconsiderable, pattern of gaining or (over time) decline in depth of L2 vocabulary knowledge was, however, witnessed for the N-DA group receiving instruction and non-ZPD feedback through mainstream approaches.

### Microgenetic Analysis of G-DA Talks

The second question was specifically shaped to explore the nature of language related episodes (LREs) in the G-DA setting to trace scaffolding or mediation of L2 learners' development of vocabulary use self-regulation. To this end, a microgenetic analysis of two LREs (following the previous studies, e.g., Davin, 2013) from the transcriptions of the participants' video-recorded G-DA talks were conducted to explore the nature of assistance that learners received in internalizing the new knowledge for intramental functioning.

#### Episode #1

(Note: For transcription conventions see Appendix D)

Persian sentence: Pedare Ali ba uoo mokhalefat kard.

English sentence: Ali's father turned against him.

Student's answer: Ali's father turned against \*to him.

- |   |    |   |
|---|----|---|
| 1 | T  | (.) ((The first prompt))  |
| 2 | S1 | Ali's father turned against to him. ((Reads the sentence silently))   |
| 3 | T  | Do you think that your sentence is correct? ((The second prompt))   |
| 4 | S1 | (.) Uhum... him?  |
| 5 | T  | OK. What's the problem with it?   |
| 6 | S1 | = Fekr mikonam jaye 'him' too in jomle dorost nist.<br>(I think the location of 'him' in this sentence is not correct.) |

- 7 S1 = Be nazare man 'him' bayad ba'd az fe'le asli beyad  
(*I think 'him' must be put after the main verb in the sentence.*)
- 8 T =OK. Fe'le asliye shoma to in jomle chiye?((The third prompt)  
(*What's the main verb in this sentence?*)
- 9 S1 (.) Turn against.
- 10 T = Doroste.  
(*That's right*)
- 11 T = Yani fek mikonid toye in jomle 'him' dar jaye sahihe khodesh nist?  
(*Do you think that 'him' in this sentence is not in its right location?*)
- 12 S1 ((laughter))
- 13 T Hala ke jaye 'him' to in jomle dorost nist, pas koja bayad beyad? ((The forth prompt))  
(*Now that the location of 'him' in this sentence is not OK, where it should be put?*)
- 14 S1 (.) ((Reading the sentence while she is talking with herself... smiles))
- 15 T Nemidoni moshkele jomle kojast?  
(*Can't you distinguish the sentence problem?*)
- 16 S1 No, I can't.
- 17 T = turned against to him ((pointing to this part of the sentence))
- 18 T = To in ghesmat ye eshkal hast. ((The fifth prompt))  
(*There is a problem with this part of the sentence.*)
- 19 T Think carefully.
- 20 S1 (.) To?
- 21 T What?
- 22 S1 Nabayad "to" biyad.  
(*It is not necessary to use "to" here.*)
- 23 T That's right. Very good. Thank you.

In Episode 1, as it is observed, the teacher in turns 1 and 3 provides the learner with the most implicit kind of prompt in order to guide her to use the opportunity to read the sentence, detect the errors, and even correct them without the tutor's assistance. It seems that the teacher's pause, as a prompt, has been effective in encouraging the learner to concentrate on her sentence so that she has been able to guess what the problem may be with it when she replies 'him?' in turn 4. Therefore, although the student has not received any direct help from the teacher or other students, the teacher's presence "triggered her attempts at self-correction" (Aljaafreh & Lantolf, 1994, p. 472). That is, although the student in Episode 1 was acting alone, as a matter of fact, she did not. In fact, DA could make a collaborative atmosphere through which the contingent help necessary to do the task had become available to the tutee.

In turns 6 and 7 the learner is trying to externalize the reason why she thinks that 'him' is not in its correct place. However, it seems that the teacher's hints in turns 8 and 11 have been beneficial so that the student notices that her hypothesis is rejected as she shows it in turn 12 by laughing.

It is noticed that, realizing that there is no problem with 'him', she is striving to find the error in other parts of the sentence. Thus, in turn 13, she starts talking to herself. That is, the tutor, by conducting cumulative G-DA, has provided the learner with opportunities for private speech as a mediational tool. According to Foley (1991), when an individual finds himself grappling with a difficult task, "he externalizes the inner order so that he may regulate himself" (p. 63). The function of private speech applied by the learners through interaction is not to communicate with someone else, but to support and help the self through problem-solving situations (Vygotsky, 1986). Finally, she overtly states in turns 13 and 15 that she cannot locate her error. This is the evidence that S1 is at the first level of developmental stages proposed by Aljaafreh and Lantolf (1994).

Importantly, Aljaafreh and Lantolf (1994) consider five general levels of transition as the students

moved from other-regulation to self-regulation and “control over the target structure” (p. 470). Whilst in the first level the learner is other-regulated, in the last one (level 5) she or he is completely self-regulated and is able to notice and correct errors without requiring any intervention from someone else. Furthermore, as they illustrate, levels 1 through 3 represent other-regulation “in which the learner must rely in some way on another individual to perform” (p. 470). However, in level 4, “The learner notices and corrects an error with minimal, or no obvious feedback from the tutor...” (p. 470). Thus, they referred to this level as partial self-regulation.

What is striking in turn 16 is that S1 is still other-regulated. To clarify, equipping S1 with implicit hints has not been able to assist her to locate and correct her error independently. She requires the teacher’s more explicit prompts to move toward self-regulation and intramental functioning. That is the reason why the teacher subsequently begins to provide more explicit help by narrowing the tutee’s search space in turns 17 and 18 to ‘turned against to him’ part of the sentence. At last, in turns 20 and 22, she is able to detect the error and provide its correct form (i.e., turned against him) and the tutor then in turn 23 confirms the correction. This is the evidence that the learner has made a promotion to level 4 of developmental stage because she has been able to notice and correct her error with minimal feedback from the tutor. However, the development is not fully self-regulated but partially self-regulated. To illuminate whether S1 has successfully appropriated the co-constructed knowledge or not, her performance in the first and second posttests was investigated. As it will be enlightened in Episode 2, her scores on both posttests were 5, the maximum score, an evidence of the effectiveness of cumulative G-DA in pushing learners from other-regulation toward fully self-regulation stage of development in terms of fostering the depth of vocabulary knowledge.

The interaction in Episode 2 involves another student who was a secondary interactant during the interactions in the first Episode. Episode 2 illustrates how S2, who was an unaddressed interactant in the previous Episode, was able to use her findings to correct her own errors.

#### Episode # 2

Student’s answer: Ali’s father \*with \*him \*turn against.

- |    |    |  |
|----|----|--|
| 23 | T  | Is there any problem in this sentence? ((The first prompt))  |
| 24 | S2 | ((Reads her sentence which is written on the board)). Yes.   |
| 25 | S2 | =Hamishe fe’le asli ba’d az fae’l miyad.<br>( <i>Main verb mostly comes after subject</i> )  |
| 26 | S2 | =Pas inja chon fe’le asli “turn against” hastesh, aval bayad “turn against”<br>ro benevisim<br>( <i>So, because in this sentence “turn against” is the main verb, it must be<br/>Written first</i> ) |
| 27 | S2 | =va sepaş “him” ro ezafe mikonim.<br>( <i>then we add “him”</i> )  |
| 28 | T  | OK.<br>( <i>(She corrects her sentence on the board: Ali’s father turned against<br/>him)</i> )  |

As it is noticed in Episode 2, S2’s sentence has more errors (with, him, and turn against) in comparison to S1’s. However, in this episode, she reveals evidence of appropriation of the assistance given in Episode 1. To illustrate, we notice considerable reduction in the amount of help required by the student to complete the correction. In fact, providing the learner with the most implicit prompts (the first prompt) was sufficient for her to self-initiate (turn 24) and self-correct her three errors (turns 25 through 27) simply on the basis of reading her sentence in the teacher’s presence.

In the current episode, S2 demonstrated signs of microgenetic development from level 1 to level 4 which can be evidence of movement toward partial self-regulation. The comparison between Episode 1 and 2 reveals that in the former, S1 through receiving five prompts, was able to move to level 4 whereas

in the later, S2 with minimal hint (i.e., just one prompt) was able to correct her errors easily. In addition, while S1 could not locate and correct her error with implicit hints so that the instructor had to provide her with explicit hint, S2 could locate and correct more errors through receiving the most implicit kind of prompt.

In general, comparing Episode 1 and 2 reveals the fact that conducting cumulative G-DA helps the group (not just the individual) work “toward mastery of a problem” (Poehner, 2009, p. 478). In other words, in cumulative G-DA setting although the student who has faced a problem as the primary interactant is apparently provided with hints and mediations until finding the correct answer, the whole class benefit from this interaction. This finding is in line with other findings (e.g., Davin, 2011; Donato, 1994; Gibbons, 2003; Lantolf & Poehner, 2010) that conducting DA in class setting enriches group’s ZPD.

Additionally, it should be noted that, according to Aljaafreh and Lantolf (1994), in level 4, the learners are not completely self-regulated, rather, they are partial-regulated; that is, they can detect and correct their errors without the tutor’s help, but their performance is not automatized. As a result, it is necessary to take their performances on the posttests into account in order to detect whether they are completely self-regulated or not. Their scores on the immediate posttest were 5, the maximum score, and their sentences are as follows:

S1: people turned against Newton.

S2: We should not turn against our teachers.

Additionally, they preserved this appropriated knowledge over time and scored 5 on the delayed posttest as well. However, their sentences after two weeks in their delayed posttests were not exact copies of those on the immediate posttest:

S1: You must not turn against your parents.

S2: I usually turn against my brother’s decisions.

## Discussion

The present study aimed to probe the effect of interactionist, cumulative G-DA on the depth of vocabulary knowledge of Iranian elementary EFL learners. The results provided further evidence for the SCT view that learning is a social enterprise which cannot be achieved in isolation; rather, it can be available under social and collaborative interaction (Vygotsky, 1978, 1986). The motive behind recent SCT-inspired studies (e.g., Mirzaei & Eslami, 2015) has been to show that social mediation and dialogic interaction within the ZPD can work as a useful and productive mechanism for language learning and development. The findings of the current study, specifically, showed that ZPD-activated collaborative languaging to regulate and do vocabulary learning tasks and to solve linguistic problems created a facilitative learning space in which L2 learners’ knowledge building or cognitive activity was mediated. This observation is in line with Swain (2010) who argues that learners’ dialogic co-creation of a ZPD with the expert to solve linguistic problems provides a situation where language use and language learning can co-occur. In addition, in line with previous studies (Gibbons, 2003; Lantolf & Poehner, 2010; Poehner, 2009), it can be argued that elementary EFL learners in a G-DA class could gain deeper L2 vocabulary knowledge because they were provided with feedback tailored to their potential levels of development while engaged in collaborative dialogue. However, students in the N-DA setting performed a limited range of functions with little need to negotiate for meaning, because they were provided with the correct sentences by the teacher without receiving step by step hints observed in the experimental group. In other words, the ZPD-sensitive feedback functioned as an appropriate temporary crutch for the G-DA participants to rely on and co-construct further knowledge and go beyond their solo abilities. Later on, they could take in the co-shaped knowledge about the target words and carry it over to the immediate and delayed posttests.

Due to the dialogic nature of DA sessions, the instructor obtained precious opportunities to detect the

students' problems regarding the intended words; thus, she was placed in a good position to take proper decisions and furnish the students with proper help which scaffolded their overcoming the current problems and move toward self-regulation. Therefore, the depth of vocabulary knowledge of the EFL learners in the experimental group of this study increased more significantly after applying cumulative G-DA than that in the control group. This is basically in line with Poehner's (2009) finding that sensitivity to the ZPD differentiates DA from conventional assessment approaches such as formative assessment. DA, in effect, is based on the tenet that a static evaluation of a child's current knowledge is not as revealing as a dynamic assessment of that learner's future potential. Assessment and instruction occur concurrently in DA in that a mediator promotes development by offering assistance to a learner while simultaneously assessing the student's abilities (Davin, 2013; Lantolf & Poehner, 2004).

In cumulative G-DA, the group members can be provided with the opportunity to benefit from the interactions as a stepping stone for their own development (Lantolf & Yanez-Prieto, 2003) and that each learner can act as a primary interactant whom can be provided with firsthand experience and learning potential by the teacher (Brown & Ferrara, 1985). To clarify, the status of a primary interactant does not denude others of the opportunity of development. In this study, conducting cumulative G-DA in front of the whole class, each time the teacher, through collaborative dialogue with an addressed individual learner, assessed her actual developmental level and discovered her ZPD. This could help the teacher to provide the learner with the needed mediation to push her toward her potentiality, whereas other unaddressed learners were apparently silent. These findings give credence to van Compernelle and Williams' (2013), and Lantolf and Poehner's (2010) position that unaddressed learners can benefit from social interactions in their milieu as far as they are actively receiving communicated information. It was revealed that cumulative G-DA interactions could help establish a community of practice in the social space of the classroom so that the students could benefit from the cooperative scaffolding provided by their teacher to resolve their vocabulary learning problems. This collaborative framework also provided the stepping stone for the whole class to use the group as their own opportunity for making development (Petrovsky, 1985). It is also in line with Donato (1988) who concluded co-construction, interaction, and social setting of the classroom can foster language learning in both individual and the group.

Nonetheless, the findings seem different from other similar studies that found collective or common ZPD as being problematic to them. For instance, as noted earlier, Mercer and Fisher (1997) suggested that application of the ZPD seems limited in the classroom context because the ZPD focuses on the individual's ZPD, whereas the classroom circumstance requires development of the class or group's ZPD. Moreover, the results of the study regarding the relative permanency of the effects of G-DA on long-term learning or developmental gains are different from Ajideh and Nourdad's (2012) idea that dynamic assessment has no delayed effects.

Additionally, several selective language related episodes (LREs) of two participants of the study were microgenetically analyzed and discussed to document the diagnostic and developmental potentials of cumulative G-DA for pushing learners from other-regulation toward self-regulation stage in terms of vocabulary learning. The results of the microgenetic analysis demonstrated that providing learners with appropriate feedback and flexible prompts from the most implicit to the most explicit ones, assists not only the addressed individual but also nearly the whole class to increase their awareness toward their errors and, thus, to increase their control over L2 vocabulary knowledge. To illustrate, cumulative G-DA was more successful than N-DA in leading students to a higher level of lexical development. In fact, in the earlier tutorial stages, the tutee was even unable to detect her errors without the teacher's intervention and prompts. In immediate and delayed posttest, however, she was able to use the target words in correct sentences and gain the complete score 5. This suggests that the learner had appropriated the feedback provided by the teacher and that had achieved greater control over her L2 vocabulary knowledge. Additionally, after working on each target word through G-DA for the first time, it was observed that the quality and frequency of the intervention of the teacher changed considerably. That is, not only the level of explicit hints needed to elicit appropriate response from the tutee, but also the 'amount' of required prompts to do the similar task (i.e., especially regarding the vocabulary knowledge of that target word)

were reduced. To clarify, the collaborative dialogue that developed within the group's ZPD provided opportunities for learners to test hypotheses and co-construct knowledge. It is exactly in line with findings of Davin (2013) that asserted through dialogue, the instructor establishes a ZPD within which students can develop discourse in terms of social appropriateness or sociolinguistic competence. It is through attending to a tutee's responsiveness to mediating prompts that a tutor may gain a clearer understanding of that learner's future (Mirzaei & Eslami, 2015; Vygotsky, 1978).

The microgenetic finding represented above resonates a deep concern raised by other SCT studies that learners' development should be investigated or assessed while it is in the process of formation in collaborative activity (Poehner & van Compernelle, 2011; van Compernelle & Williams, 2013), insisting "any assessment that fails to determine the extent to which the person's performance is modifiable is incomplete" (Lantolf & Thorne, 2006, p. 329).

## Conclusion

The findings showed that adoption of cumulative G-DA was effective in helping students to attain high gains in vocabulary learning in the whole class setting. The effectiveness of this kind of assessment, especially in the immediate posttests, may support the basic underlying assumptions of cumulative G-DA. In other words, the teacher provides the addressed learner with mediation in order to solve his or her problem; however, since interaction takes place before all classroom members, other learners are exposed to the collaborative dialogue and can benefit from it. Thus, although the secondary interactants were not directly engaged in dialogue with the tutor during each interaction, "they acted as peripheral participants" (Davin, 2013, p. 10). Therefore, the co-construction of a ZPD with an individual learner pushed the development of a group of students forward (Poehner, 2009) in terms of short- and in long-term gains. The qualitative analysis of the audio-recorded LREs provided further support for this finding by probing the ZPD levels that constituted the L2 microgenesis process.

The findings of the present study may be of value to material developers, teachers, and learners. Importantly, the results of the study are especially useful for the teachers who have under-achievers in their classes. To make these learners catch up with their over-achiever classmates, teachers can arrange cumulative G-DA diagnostic and treatment sessions. In so doing, their understanding of the weaknesses and strengths of their students can be deepened and can give them the appropriate contribution. Furthermore, G-DA can set the scene for the learners to not only learn new vocabularies but also practice and learn how to utilize them in correct sentences which is of paramount importance to the L2 learning process. It thus seems necessary for language material developers to consider the usefulness of DA and G-DA more than before and to invest more in designing and applying instructional materials which help teachers focus more on the learners' depth of vocabulary knowledge. In practice, such kinds of materials should pave the way for EFL teachers to improve learners' vocabulary knowledge by integration of teaching and assessment. Finally, the results of the present study can be utilized in teacher education programs in pre-service as well as in in-service meetings programs so that teachers or teacher educators can be more familiar with the advantages of this kind of assessment in increasing their L2 learners' depth of vocabulary knowledge.

It should be added at this point that the design and implementation of DA, in general, and G-DA, in particular, seem to be largely susceptible to the application of computers, as recently witnessed by Poehner, Zhang, and Lu's (2015) use of DA in a computerized format (or C-DA). It is thus urgent that future research plan to explore the potentials of corpus-based English language teaching (C-BELT) systems and C-DA for instruction and assessment, which is in its infancy now (Poehner et al., 2015), and unaddressed in this study. It is worth further noting that the current study was purposefully limited to Iranian EFL learners at the elementary level of language proficiency; put it another way, learners at other proficiency levels are left out. Moreover, all participants were female EFL learners due to institutional rules of Iran's Education Ministry prohibiting co-education in primary and high schools, and it might be

the case that male and female students demonstrate different patterns of scaffolding and interaction and different attitudes towards them (Huffman, 2010) as well.

### The Authors

*Azizullah Mirzaei* is Associate Professor of Applied Linguistics at Shahrekord University. He has publications in different journals (e.g., English Language Assessment, Journal of Pragmatics, Educational Psychology, System, and ReCALL). His research interests include: Vygotsky-inspired Sociocultural Theory and Second Language Learning, Interlanguage and Intercultural Pragmatics, Language Testing and Assessment, and Teacher Education.

English Department  
Faculty of Letters and Humanities  
Shahrekord University  
Shahrekord, Iran  
Tel: +98-9125588577

*Leila Shakibaei* is an M.A. student of Teaching English as a Foreign Language (TEFL) at Shahrekord University. Her research interests include: Sociocultural Theory and Second Language Learning and Dynamic and Group Dynamic Assessment.

English Department  
Faculty of Letters and Humanities  
Shahrekord University  
Shahrekord, Iran  
Tel: +98-9377395193

*Ali Akbar Jafarpour* is Assistant Professor of Applied Linguistics at Shahrekord University. He has publications in different (inter)national journals. His research interests include: Collocational Concordancers, ESP, and Language Teaching Methodology.

English Department  
Faculty of Letters and Humanities  
Shahrekord University  
Shahrekord, Iran  
Tel: +98-9131845918

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