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# Interventionist vs. interactionist models of dynamic assessment (DA) in the EFL classroom: impacts on speaking accuracy and fluency (SAF), foreign language classroom anxiety (FLCA), and foreign language learning motivation (FLLM)

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## Abstract

In spite of their pivotal role in language learning, psychological variables involved in language learning have received less attention in empirical research. Therefore, this paper tried to inspect the effects of interventionist DA, interactionist DA, and non-DA on EFL students' SAF, FLCA, and FLLM. To achieve this goal, 78 respondents were chosen and randomly separated into three groups: EG1 (interactionist DA), EG2 (interventionist DA), and CG (non-DA). Before starting the treatment, the participants' SAF, FLCA, and FLCM were checked through three related pretests. As the treatment, the non-DA students were given specific topics, and they were asked to discuss them without any DA-oriented interventions. The EG1 was evaluated and provided with the needed help by interaction-oriented DA techniques, whereas the EG2 was trained by DA-oriented instruction following Lantolf and Poehner's (*Language Teaching Research* 15: 11–33, 2011) scales to measure and aid the students' speaking ability in their discussions. At the end of the study, the post-tests of SAF, FLCA, and FLLM were administered to check the impacts of the treatment. Analyzing the data through one-way ANOVA tests, it was revealed the two models of DA (i.e., interactionist and interventionist) had a significant positive effect on EFL learners' SAF. Moreover, it was revealed that both DA models not only increased the EFL learners' motivation but also lowered their FLCA. This research has multiple implications for both EFL learners and teachers.

**Keywords:** DA, Interactionist DA, Interventionist DA, Speaking accuracy, Speaking fluency, FLCA, FLCM

## Introduction

A main issue in the domain of language learning is figuring out how much EFL students have acquired and how much they are able to learn in the future. We can determine this issue by using several types of assessments. Lately, emphasis has been put on the sort

of assessments in which the practices of assessment and instruction can be combined (Poehner & Lantolf, 2005). Such combination is made possible by DA which is rooted in Vygotsky's sociocultural theory (SCT), particularly in his theory of zone of proximal development (ZPD) (Poehner, 2008). The focus of SCT is on the role of the interactions and mediations among the learners and other people present in the surrounding situations. DA, according to Poehner and Infante (2015), can be seen as a link between teaching and learning, evaluation and instruction, and the cognitive and constructivist elements of knowledge acquisition.

DA is characterized as a method to realize individual differences and their benefits for learning which inserts interventions in assessment procedures. DA administration processes have made it prominent; its administration encompasses several kinds of interventions that result in learners' performance development and, in this way, instruction is combined as an important part of assessments (Farhady & Tavassoli, 2021). Different intervention methods are recommended, and what gains significance is knowing what method is appropriate for a particular situation. Two key DA methods that can assist students to understand their full potential are interventionist and interactionist (Poehner, 2008).

Fan et al. (2021) argue that DA contributes significantly to the assessments of culturally diverse students. According to Wang and Li (2019), there exist two extensive kinds of culture, i.e., individualist culture, in which individuals develop their autonomy and are in search of their own interests, and collectivist culture, in which individuals attempt to keep ranked relations. Saving face means that public self-images that people want to claim for themselves (Tannenbaum, 2019) are quite important to collectivists (Sun, 2019). Based on the Theory of Face Negotiation proposed by Ting-Toomey and Kurogi (1998), collectivists are "inclined to utilize more self-effacing techniques, proactively, towards potential face threat" (p. 192) more than individualists, and consequently, they utilize more defensive face-work techniques.

According to the sociocultural theory of mind proposed by Vygotskian (1978), DA opens its way into the theoretical discussion in the language teaching domain. DA views assessment and teaching to be inextricably linked (Lantolf, 2004). Nevertheless, despite such sincere welcome on the researchers' part in this field, DA cannot be extensively practiced on the real levels of the classroom as it has been debated that DA cannot include students with diverse ZPD (Poehner, 2009), which refers to the gap between what students can conduct autonomously and what they can carry out with the help of other proficient students (Vygotsky, 1978). To solve this difficult problem, Poehner (2009) offered the original work of Vygotsky and suggested the notion of group DA (GDA). GDA is grounded on the principle that as the graduated dialogic feedbacks occur between the instructors and the students occur on the social levels, other students who are in those dialogic situations can profit from the exchanged feedback. Furthermore, the instructors can invite numerous students into play and adjust the feedback to their ZPD to co-shape more awareness and knowledge (Ableeva, 2010; Abdolrezaipoor & Ghanbari, 2021; Hidri, 2014; Zhang et al., 2022).

Based on the Vygotskian view towards DA, improvement is emphasized, which is the stimulation of developed mental functions of the students. These psychological functions emerge through dynamic interventions of a more knowledgeable person. Nevertheless,

entering DA into clinical contexts was a new reform in assessment procedures. According to Haywood and Lidz (2007), the vital component in instructional contexts can be those professionals who conduct the assessment and are involved in the instruction and diagnostic interventions of the students. If assessments are supposed to be highly useful to aid students to learn successfully, they should be used during learning and teaching procedures rather than at the end of the term (Abdollahi et al., 2022; Kolganov et al., 2022; Yang & Qian, 2020).

According to Poehner (2008), there are abundant methods for DA. The difference in the methods is concerning their way of supplying mediations. The interventionist and interactionist are two focal methods of DA, which, for Lantolf and Poehner (2011), are referred to as two types of interventions (mediations) that tend to remove the learning difficulties of the students. Nonetheless, every method embraces various ways to deal with such matters. The interventionist DA concentrates on mediations built on a pre-scripted hint from implicit to explicit. The interactionist methods focus on students' responsivity for mediations; so, it is important to the examinees. In interventionist DA, a quantitative DA puts a quantitative interpretation on ZPD.

The distinctive feature of interventionist DA is the application of "standard administration procedure and form of help to generate simply quantifiable consequences that can be utilized to compare the groups, and can be compared with other scales and utilized to predict about performances on future exams" (Poehner, 2008, p.18). In this model, common test-teach-retest design, the students' ZPD is quantitatively calculated as the differences between the performances of the pupils before and after the intervention provided by the teachers.

During an interventionist method, the examiner is not allowed to react to students' requirements; instead s/he should follow a very organized method to mediation in which all leading questions, points, and prompts are organized in advance hierarchically (Poehner, 2008). In other words, the teacher provides standard interventions. An interactionist DA puts qualitative interpretations on ZPD. In this approach, DA is conceived as a device for obtaining insights into the sorts of psychological procedures that the students can display in the subsequent phases of improvement and a tool to recognize the types of education or help that may be necessary if the students are to understand these potential (Liu et al., 2021; Yang & Qian, 2017). It measures and promotes the students' cognitive development by using the ZPD concept of Vygotsky. This qualitative method to DA highlights learning over assessments. During this type of DA, leading prompts, hints, and questions are not organized in advance, and they are made by the mediated dialogues (Lantolf & Poehner, 2011). During the interactions, the examiners react to the examinees' requirements and continually recalibrate their mediation (Ableeva, 2010; Vadivel et al., 2021). Interactionist DA follows Vygotsky's tendency for dialogic interactions. In this method, help arises from the interactions between the mediators and the students and is consequently extremely sensitive to the students' ZPD.

Two major models pertinent to this study are Feuerstein's interactionist model (FIM) and Brown's interventionist model (BIM). In FIM, Feuerstein fully integrates instruction and assessment in a way that both concepts cannot exist without each other (Poehner, 2008). The cognitive capabilities of people are not fixed and can be adapted or developed by applying intervention; hence, the general hypothesis concerning the normal



distribution of the conditional models of intelligence and psychometrics is argued (Feuerstein & Feuerstein, 2001). A major problem in these types of assessments is the problem of cultural differences (Rassaei, 2020). Pressisen and Kozulin (1995) asserted that in the Mediated Learning Experience (MLE) model of Feuerstein, the stimulus-response method is altered in a manner that the learners collaborate with more skilled friends who assist the students via selecting, changing, growing, and elucidating the objects with the students by mediation. Poehner (2008) stated that this model differs from the other models of instructions in that it stresses on assisting the students to learn how to gain more data. It attempts to enhance the students' capabilities in learning significant abilities and determining effective strategies of problem-solving.

The Brown's Interventionist Model (BIM) is based on some prompts needed to gain the desirable answers. Noels et al. (2019) asserted that the potential of the pupils' learning, explained as the gain scores, is foreseeable through some prompts needed to reach the goals and the degree to which learning is conveyed to other activities. The interventionist models of Brown differ from the interactionist models of Feuerstein regarding the fact that in Brown's model of DA, mediation is arranged from the most implicit one to the most explicit one and ends with the correct responses. In these models, the exams are done in approximately standardized methods (Poehner, 2008). If the pupils do not perform the tasks efficaciously, the teachers provide them with the needed prompts.

Based on SCT, humans' activities occur in cultural settings. Accordingly, learning does not take place individually, and new information is not conveyed from a more educated person to a less educated one. Learning is a dynamic activity in which both students and instructors are engaged. Correction of errors is a social task, including joint participation and important transactions among the teachers and students. Through mediation, the instructors guide students to become cognizant of their mistakes and properly reformulate what they intend to communicate. Concurrently, the teachers assess the students' answers to the mediations they receive to modify their future education to their developing communication capabilities. In interactionist methods to DA, the mediators utilize unscripted mediation forms, adjusted to the students' emergent requirements. Mediation starts with implicit moves to help students to discover and correct their mistakes, but it is not pre-scripted. Nonetheless, interventionist DA contains scripted mediations in the form of questions, points, and prompts ranked from the most implicit to the most explicit (Ahmadi Safa et al., 2016; Khatib & Ahmadi Safa, 2011; Vadivel & Beena, 2019). Pre-scripted prompts are applied as mediations to measure students' emerging linguistic capabilities based on the quality and frequency of prompts required for accurate reformulation. Consequently, mediations in the interventionist method are not as malleable as the interactionist DA. Nevertheless, it is less challenging for the mediators, it can be applied in whole-class or one-on-one interaction, and is more useful in helping second language acquisition than supplying feedback non-systematically.

The importance of accuracy appears to rise as a result of its role in explaining how students learn a foreign language (Foster & Wigglesworth, 2016). Nonetheless, its scale includes some extent of "personal judgments" (p. 112). For assessing this aspect of L2 uses, it is essential to make an important decision about the standard to select and the sternness of deviance from this standard. Kuiken and Vedder (2014) stated that the features of the raters can influence their decisions on diverse speaking features such as

accuracy. Fluency is the capability to continue speaking naturally with all accessible linguistic sources and irrespective of grammar errors (Gower *et al.*, 2005). Fluency is the creation of spoken statements with the least hesitations and pauses (Ellis & Barkhuizen, 2005). Because of the significance of speaking fluency, it has been examined by several scholars (e.g., Thomson, 2018; Yufrizal, 2018; Wahyurianto, 2018; Syamdianita *et al.*, 2018). Accuracy is “the degree to which the language generated in doing the tasks obeys the target language standards” (Ellis, 2003, p. 339). Accuracy was the subject of numerous kinds of research (e.g., Toni *et al.*, 2017; Pourdana & Bahram, 2017; Navidinia *et al.*, 2018).

The other variable in this study is motivation. All proper language learning situations have an undisputable dependency on the presence of intrinsic motivation (IM) in language students. The construct of “integrativeness”—an inclination to learn a language to come closer to the other language’s society (Gardner, 2001) is one of the major matters to be regarded in language learning by educators and experts. To learn a language, various processes and skills are needed. Kramersch (2001) argued that learning a language is not similar to learning chemistry or other lessons; it involves the cognitive and linguistic skills of the students and their cultural, social, historical, and emotional skills. Therefore, learning another language is a multidimensional act that lies behind the cognitive and linguistic capacities of the students and needs affective and sociocultural abilities.

Because IM is one of the major variables in language learning, many researchers are inclined to examine its impacts on foreign language students and to investigate the degree to which students’ success and achievement are influenced by it. Dornyei’s (1998) L2 motivation model, which is considered a process-centered model, focuses on the IM’s dynamic capacities and its ability to be influenced by various variables such as time and environment; the model also suggests that motivation cannot be stable during the learning process in the long run. Consequently, the construct of static traits is no longer endorsed. Also, it is ostensible in several kinds of research that inherently motivated students are better than extrinsically motivated students. IM is better than extrinsic motivation (EM), and EM is not as all time as IM. In the process of learning a language, instructors’ tasks are not just to produce motivation in students but also to assist them with its preservation (Maslow, 1970). As it appears, in the Iranian EFL setting, there is not much attention paid to the students’ IM. Students take part in language learning mostly because they want to find jobs or to achieve educational objectives. Consequently, most students think that it is hard to keep on with their language learning. The other problem for EFL learners is test anxiety. One of the main concerns of all assessments is the assessee’s anxiety level within the assessment (Vadivel, 2021; Zhang & Liu, 2013). Based on the mentioned problems, the current research aims at knowing whether the incorporation of such DA mediations or interventions can bring about positive impacts on decreasing anxiety and increasing the motivation of EFL students.

#### **Previous studies**

Numerous studies have been carried out on the impacts of DA on reading skills (Ebadi & Saeedian, 2019; Farokhipour *et al.*, 2019; Kazemi *et al.*, 2020), writing (Babamoradi *et al.*, 2018; Heidari, 2020; Rahmani *et al.*, 2020; Shabani, 2018), speaking (Ahmadi Safa *et al.*, 2015; Bahador & Hatami Mofrad, 2020; Estaji & Farahanynia, 2019; Ghahderijani

et al., 2021; Kazemi & Tavassoli, 2020; Safdari & Fathi, 2020; Çetin Köroğlu, 2019), grammar (e.g., Estaji & Forough Ameri, 2020; Lantolf & Poehner, 2011; Alemi et al., 2019), and vocabularies (e.g., Gharekhani & Seyyed Rezaei, 2015; Sarani & Izadi, 2016). The majority of these researches have applied the general framework of DA; nonetheless, rare studies, especially in the Iranian context, have checked the influences of interactionist vs. interventionist models of DA on three variables (i.e., SAE, FLCA, and FLLM).

All in all, DA is a direction towards assessing students' attainments by including mediations into the process of assessments and tries to incorporate appraising and learning. Different models of DA have been used in SLA and have confirmed their important assistance; however, there is a dearth of studies concerning their application for learning speaking fluency and accuracy in general and FLCA and FLLM in particular. Therefore, this research, concentrating on oral performances, was designed to use the interventionist and interactionist DA methods in practice and examine the impacts of every method on the students' oral performance and improvement. The other goal of this research was to examine the ways each DA method can influence students' classroom anxiety and motivation in an Iranian setting. Thus, four research questions were formulated to achieve these purposes:

- 3 • RQ1: Is there any significant difference among the impacts of the interventionist DA, interactionist DA, and conventional non-DA models of instruction on EFL students' speaking fluency?
- RQ2: Is there any significant difference among the impacts of the interventionist DA, interactionist DA, and the conventional non-DA models of instruction on EFL students' speaking accuracy?
- RQ3: Is there any significant difference in EFL students' FLCA in the interventionist interactionist and non-DA groups from pretest to posttest?
- RQ4: Is there any significant difference in EFL students' FLLM in the interventionist, interactionist, and non-DA groups from pretest to posttest?

## Method

### Design of the study

Because we were unable to choose the participants at random for this investigation, we used a quasi-experimental approach. As a result, the participants in this study were chosen using a non-random sampling technique. A control group and two experimental groups participated in this research. The current study used four dependent variables—speaking fluency, speaking accuracy, FLLM, and FLCA—and two independent variables—interventionist DA and interactionist DA. Age, degree of proficiency, and gender of the participants served as the research's control variables.

### Participants

The sampling method applied in this study was convenience sampling or nonprobability sampling (Ary et al., 2018). Among 105 EFL students studying at five private language institutes in Tabriz (Tabriz, Iran), a sample of 78 participants (43 females and 35 males) was selected based on the findings of the Oxford Quick Placement Test (OQPT).



Accordingly, the language learners at the upper-intermediate level were chosen to participate in the study. The participants were from diverse socio-economic backgrounds, with an age range from 17 to 21. There were 26 learners (14 females and 12 males) in experimental group 1 (EG1/interactionist DA), 26 students (17 females and 9 males) in experimental group 2 (EG2/interventionist DA), and 26 students (15 females and 11 males) in the control group (CG/non-DA). The participants were given informed consent to take part in this research project.

### **Instruments**

The following instruments were utilized in this research:

#### ***Oxford Quick Placement Test***

To determine the levels of English language proficiency of the students, the OQPT was given to them. This test included 60 multiple items measuring vocabulary, grammar, and reading comprehension. According to the test's 60 multiple-choice items, students with scores between 0 and 10 were beginners, those between 11 and 17 were considered breakthrough students, those between 18 and 29 were elementary students, those between 30 and 39 were pre-intermediate students, those between 40 and 47 were intermediate students, those between 48 and 54 were upper-intermediate students, and those between 55 and 60 were considered advanced students. The reliability of the mentioned test in this study was 0.91.

#### ***Speaking pre-test***

This pretest was administered at the beginning of the instruction to understand if the respondents were homogenous in terms of speaking accuracy and fluency. It had some productive tasks including picture description tasks, storytelling, some essay-type questions about the speakers' personal information, and general information about the computer, Internet, sports, etc. The responses of the participants to the questions were recorded and assessed in terms of fluency and accuracy utilizing the semantic differential scales. The test reliability was calculated by the inter-rater approach, and it was 78 which was acceptable.

#### ***Speaking post-test***

The speaking post-test was a test given at the termination of instruction to measure the impacts of treatment. This post-test scale employed in the current research comprised the same productive tasks as utilized in the pretest. The respondents' responses to the items of the post-test were recorded and assessed in terms of accuracy fluency and using the semantic differential scale. The post-test reliability was computed via an inter-rater approach, and its index was 0.80.

#### ***Speaking fluency and accuracy rating scale***

In this research, speaking fluency was assessed based on Ellis (1990 as cited in Ellis & Barkhuizen, 2005) in terms of some syllables generated per minute on a task. To do so, the number of syllables generated was counted and assigned by the number of minutes that lasted to generate the spoken outputs. Moreover, speaking accuracy was assessed as



the number of error-free clauses assigned by the total number of independent clauses, sub-clausal units, and subordinate clauses multiplied by 100 (Foster & Skehan, 1996 as cited in Ellis & Barkhuizen, 2005). As Ellis and Barkhuizen (2005) maintained, this scale of speaking accuracy is the most commonly utilized scale in the speaking domain.

#### ***Foreign language classroom anxiety scale (FLCAS)***

To examine the participants' anxiety levels both before and after the DA intervention, FLCAS, designed by Horwitz et al. (1986), was utilized. It had 33 statements on a 5-point Likert scale (1 = absolutely agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = absolutely disagree) as a tool for showing "test anxiety, communication nervousness, and fright of negative evaluations in the oral English classrooms" (Liu, 2007, p. 124). This scale was selected as it is frequently utilized as a scale of anxiety in numerous investigations, and its reliability was satisfactory according to Cohen (1988) ( $\alpha = 0.71$ ).

#### ***FLLM questionnaire***

The translated form of the student motivational state questionnaire included 20 Likert scale statements ranging from totally not true (1) to definitely true (6). This tool assessed the learners' situation-specific motivational disposition concerning their present L2 courses, and so did not involve statements seeking to tap more common motivational and attitudinal variables including the incentive values of English proficiency or 'integrativeness,' and the author's personal copy of three multi-item scales: learners' attitude towards the courses (statements 1 to 9), linguistic self-confidence (statements 10 to 17), and L2 class anxiety (statements 18 to 20). The questionnaire was translated from English into Persian, and the Persian version was checked by some experts to guarantee the validity of the original version. To examine the validity of the translated form, expert opinions were used, and to examine its reliability, Expert opinions were used to examine the validity of the translated form, and to examine its reliability, Cronbach's alpha was used ( $r = 0.85$ ).

#### ***Data collection procedure***

To carry out the present research, firstly, the OQPT was performed to make the subjects homogenous; then, they were separated into three groups, one control group (non-DA group) and two experimental groups of DA. To assess the participants' speaking skills, a pre-test of speaking was administered. Furthermore, their FLCA and FLLM were checked before the treatment. For the DA groups, the treatment lasted twelve sessions in 12 weeks. In the non-DA group, traditional speaking instruction was used, and no DA treatment was provided for them during the course. The researchers gave specific topics to the students and asked them to discuss the topics without any DA-oriented interventions for evaluating and developing their speaking abilities. The respondents of the other group were evaluated and given the needed help by interactionist DA procedures. In this class, help and intervention were delivered through the interactions between the assessors and students. The teacher interacted with each student to determine the appropriate level of mediation before assigning the learners various tasks to complete using graduated prompts, such as leading questions, examples, and detecting errors, which escalated in complexity. The instructor made an

effort to react to the behavior in a timely and appropriate manner. The development of this method is momentarily sensitive to the ZPD of the learners. In the other EP, the impacts of interventionist DA were examined. As is the case for the other DA classes, the students, in their speaking activities, received intervention from the teacher to both evaluate and enhance their speaking skills. The teacher attempted to take learners' future abilities into account in addition to their present and past abilities by integrating teaching with assessment simultaneously accompanied by mediation. The teacher used the test-intervene-retest format and concentrated on the quantitative outcomes of the intervention. The students received DA-oriented interventions based on the scale of Lantolf and Poehner (2011), which was used to suggest mediations according to the learner's answers. If a learner's answers were accurate, no mediations were provided. But if their answers were not right, the teacher chose one of the 8 forms suggested by the scale of Lantolf and Poehner (2011) including (1) teachers' pauses; (2) teachers' repetitions of the entire phrase questioningly; (3) teachers' repetitions of error parts of the sentences; (4) teachers' questions, for instance, what is the problem of this sentence; (5) teachers point out the wrong words; (6) teachers ask either...or... questions; (7) teachers identify the right answers; and (8) teachers explain why. It can be seen that the list moves from the most implicit to the most explicit form in presenting the mediations for the students in the DA class. This method is identical to particular kinds of static assessments; that is, the sorts of assistance suggested are standardized and concentrate on the psychometric characteristics of assessment processes. Similarly, the intervention for this class lasted twelve sessions in 12 weeks. A post-test of speaking was given to all three groups when the treatment was ended. Moreover, to check the participants' anxiety and motivation, the posttest of FLCA and FLLM was given at the termination of the research.

## Results

As a first step, we got sure about the normality of the data by conducting the Kolmogorov-Smirnov test. Thus, it could be concluded that parametric methods could be utilized for testing the related research hypotheses. Following this conclusion, a one-way ANOVA was run to find out if there were any statistically remarkable differences between the means of the three groups in the pre-test of speaking.

The descriptive statistics in Table 1 suggest that the three study groups (CG, EG1, & EG2) had rather similar standard deviations and mean scores on the SAF, FLCA, and FLLM pretests. Then, a one-way ANOVA was conducted to check whether the three groups' mean scores in the pre-test of these four variables (i.e., speaking accuracy, speaking fluency, FLCA, and FLLM) were statistically significant or not (Table 2).

Based on the above statistics, the significance value is smaller than 0.05; thus, there were no statistically meaningful differences between the three groups' SAF pretests. This finding suggests that the participants' level of SAF, FLCA, and FLLM was the same in the pre-test of SAF, FLCA, and FLLM, respectively, before the treatment. Furthermore, effect size (ES) was used to examine the statistical significance of the results. According to Cohen (1988), the results of eta square are as follows: 0.01 = small effect, 0.06 = moderate effect, and 0.14 = large effect.

**Table 1** Means and standard deviations in pre-tests of SAF, FLCA, and FLLM of CG, EG1, and EG2

	N	Means	Std. deviations	Std. errors
FLCA pre				
CG	26	80.30	20.78	4.07
EG1	26	81.88	16.34	3.20
EG2	26	81.91	19.96	3.91
Total	78	81.36	18.89	2.13
FLLM pre				
CG	26	37.19	6.78	1.33
EG1	26	36.76	8.95	1.75
EG2	26	37.94	9.26	1.81
Total	78	37.30	8.31	0.94
Fluency pre				
CG	26	52.14	2.47	0.48
EG1	26	53.03	1.83	0.36
EG2	26	52.16	2.41	0.47
Total	78	52.44	2.27	0.25
Accuracy pre				
CG	26	93.26	3.36	0.66
EG1	26	94.53	3.30	0.64
EG2	26	93.76	3.42	0.67
Total	78	93.85	3.36	0.38

**Table 2** Comparing CG, EG1, and EG2 mean scores on the pre-test of SAF, FLCA, and FLLM (one-way ANOVA)

	Sum of squares	df	Mean squares	F	Sig.	Eta squared
FLCA pre						
Between groups	43.96	2	21.98	.06	0.94	.00
Within group	27447.64	75	365.96			
Total	27491.60	77				
FLLM pre						
Between groups	18.35	2	9.17	0.13	0.87	.00
Within groups	5300.81	75	70.67			
Total	5319.17	77				
Fluency pre						
Between groups	13.39	2	6.69	1.31	0.27	.03
Within groups	383.30	75	5.11			
Total	396.69	77				
Accuracy pre						
Between groups	21.25	2	10.62	0.94	0.39	.02
Within groups	848.19	75	11.30			
Total	869.44	77				

### Results pertaining to the first research question

The first research question attempted to examine probable differences between the effects of interventionist DA, interactionist DA, and non-DA methods on the speaking fluency of EFL students.

As Table 3 presents, the mean scores of the CG ( $M = 52.45$ ), EG1 ( $M = 62.84$ ), and EG2 ( $M = 57.08$ ) differed from each other on the posttest of speaking fluency. Therefore, a one-way ANOVA was utilized to discover if there were any statistically meaningful differences between the means of CG, EG1, and EG2.

According to Table 4, the sig. value is less than 0.05; thus, it can be claimed that the three groups conducted differently on speaking fluency. As Table 4 reports, the eta-squared statistic (0.79) shows a large effect size.

The outcomes of the Scheffe post-hoc test in Table 5 reveal that there were significant differences between the performances of the CG and the two EGs on the speaking fluency posttests ( $p < .05$ ). Furthermore, the findings implied that EG1 outperformed EG2 in the speaking fluency.

### Results pertaining to the second research question

The second research question raised in this study aimed to investigate the possible differences between the effects of interventionist DA, interactionist DA, and non-DA methods on the speaking accuracy of EFL students.

Based on Table 6, the mean scores of the CG ( $M = 94.05$ ), EG1 ( $M = 124.76$ ), and EG2 ( $M = 118.53$ ) were different from each other on the speaking accuracy posttests. Therefore, one-way ANOVA was conducted to analyze the differences among the means of CG, EG1, and EG2 (Table 7).

**Table 3** Descriptive statistics: the participants' post-test of speaking fluency scores

	N	Means	Std. deviations	Std. errors
CG	26	52.45	2.26	0.44
EG1	26	62.84	1.88	0.36
EG2	26	57.08	2.38	0.46
Total	78	57.46	4.79	0.54

**Table 4** Findings of one-way ANOVA: the participants' posttest of speaking fluency scores

	Sum of squares	df	Mean squares	F	Sig.	Eta squared
Between groups	1408.39	2	704.19	147.36	.00	0.79
Within groups	358.39	75	4.77			
Total	1766.78	77				

**Table 5** Results of the Scheffe post-hoc test: the participants' post-test of speaking fluency scores

(I) groups	(J) groups	Mean differences (I-J)	Std. errors	Sig.	95% confidence intervals	
					Lower bound	Upper bound
CG	EG1	-10.38	0.60	.00	-11.90	-8.87
	EG2	-4.63	0.60	.00	-6.14	-3.12
EG1	CG	10.38	0.60	.00	8.87	11.90
	EG2	5.75	0.60	.00	4.24	7.26
EG2	CG	4.63	0.60	.00	3.12	6.14
	EG1	-5.75	0.60	.00	-7.26	-4.24



**Table 6** Descriptive statistics: the participants' post-test of speaking accuracy scores

	N	Means	Std. deviations	Std. errors
CG	26	94.05	3.09	0.60
EG1	26	124.76	3.30	0.67
EG2	26	118.53	3.42	0.67
Total	78	112.45	13.72	1.55

**Table 7** Results of one-way ANOVA: the participants' posttest of speaking accuracy scores

	Sum of squares	df	Mean square	F	Sig.	Eta squared
Between groups	13704.85	2	6852.42	638.23	.00	0.94
Within groups	805.24	75	10.73			
Total	14510.09	77				

As the results show, the sig. value is smaller than 0.05, and it could be inferred that the differences in speaking accuracy post-test scores among the three groups were noticeable ( $\eta^2 = 0.94$ , large effect). The post-hoc Scheffe test could help to specifically examine this difference between the groups.

As Table 8 demonstrates, the performances of the CG and the two EGs on the speaking accuracy posttests were significantly different ( $p < .05$ ). Besides, the learners in the EG1 perform better than their counterparts in EG2.

#### Results pertaining to the third research question

The objective of the third research question was to examine the differences between the influences of interventionist DA, interactionist DA, and non-DA methods regarding their influence on EFL students' FLCA.

As depicted in Table 9, the mean scores of the three groups were different from one another as follows: CG ( $M = 81.38$ ), EG1 ( $M = 130.88$ ), and EG2 ( $M = 111.91$ ). A one-way ANOVA was conducted to inspect any substantial differences between the three groups (CG, EG1, & EG2).

As shown in Table 10, the three groups of this research gained different achievements in the post-tests of FLCA. The amount of sig. (.00) indicates a substantial difference in FLCA post-tests among the three groups with a large effect size ( $\eta^2 = 0.54$ ).

**Table 8** Outcomes of the Scheffe post-hoc test: the participants' post-test of speaking accuracy scores

(I) groups	(J) groups	Mean differences (I-J)	Std. errors	Sig.	95% confidence intervals	
					Lower bound	Upper bound
CG	EG1	-24.48	0.90	.00	-26.75	-22.21
	EG2	-30.71	0.90	.00	-32.98	-28.44
EG1	CG	24.48	0.90	.00	22.21	26.75
	EG2	-6.23	0.90	.00	-8.50	-3.96
EG2	CG	30.71	0.90	.00	28.44	32.98
	EG1	6.23	0.90	.00	3.96	8.50

**Table 9** Descriptive statistics: the participants' post-tests of FLCA scores

	N	Means	Std. deviations	Std. errors
CG	26	81.38	20.55	4.03
EG1	26	130.88	16.34	3.20
EG2	26	111.91	19.96	3.91
Total	78	108.06	27.83	3.15

**Table 10** Findings of one-way ANOVA: the participants' posttests of FLCA scores

	Sum of squares	df	Mean square	F	Sig.	Eta squared
Between group	32432.48	2	16216.24	44.70	.00	0.54
Within groups	27206.26	75	362.75			
Total	59638.74	77				

Across the groups, significant differences were determined; however, to explore where the differences exist, the post hoc test was run. The findings are provided in Table 11.

Based on Table 11, the post hoc comparisons demonstrated that the mean score of EG1 (the interactionist group) was significantly different from that of EG2 as well as CG. Based on the sig. value, the revealed differences were meaningfully remarkable.

#### Results pertaining to the fourth research question

For addressing the fourth research question, a one-way ANOVA was applied as is shown in the following tables:

Considering the learners' motivation (Table 12), the mean scores of the three groups were dissimilar as follows: the CG ( $M = 37.46$ ), EG1 ( $M = 83.76$ ), and EG2 ( $M = 74.94$ ).

Based on Table 13, the sig. value is less than 0.05, showing that the participants conducted different performances on the FLLM post-test. Additionally, the results display that the eta squared is as  $\eta^2 = 0.85$  (large effect size). Following this step, the post-hoc Scheffe test was carried out to inspect the mean efficacy of the three groups.

As indicated in Table 14, the performances of the CG and the two EGs were significantly different ( $p < .05$ ) when FLLM scores were considered. Moreover, the outcomes of the post hoc Scheffe test revealed that the students in the EG1 outperformed their counterparts in EG2.

**Table 11** Results of the Scheffe post-hoc test: the participants' post-test of FLCA scores

(I) groups	(J) groups	Mean differences (I-J)	Std. errors	Sig.	95% confidence intervals	
					Lower bound	Upper bound
CG	EG1	-49.50	5.28	.00	-62.69	-36.30
	EG2	-30.53	5.28	.00	-43.72	-17.33
EG1	CG	49.50	5.28	.00	36.30	62.69
	EG2	18.96	5.28	.00	5.77	32.16
EG2	CG	30.53	5.28	.00	17.33	43.72
	EG1	-18.96	5.28	.00	-32.16	-5.77

**Table 12** Descriptive statistics: the participants' post-test of FLLM

	N	Means	Std. deviations	Std. errors
CG	26	37.46	6.92	1.35
EG1	26	83.76	8.95	1.75
EG2	26	74.94	9.26	1.81
Total	78	65.39	21.84	2.47

**Table 13** Findings of one-way ANOVA: the participants' post-tests of FLLM

	Sum of square	df	Mean squares	F	Sig.	Eta squared
Between groups	31423.91	2	15711.95	220.28	.00	0.85
Within groups	5349.47	75	71.32			
Total	36773.38	77				

**Table 14** Findings of the Scheffe post hoc test: the participants' posttest of FLLM

(I) groups	(J) groups	Mean differences (I-J)	Std. errors	Sig.	95% confidence intervals	
					Lower bound	Upper bound
CG	EG1	-46.30	2.34	.00	-52.15	-40.45
	EG2	-37.47	2.34	.00	-43.32	-31.62
EG1	CG	46.30	2.34	.00	40.45	52.15
	EG2	8.82	2.34	.00	2.97	14.67
EG2	CG	37.47	2.34	.00	31.62	43.32
	EG1	-8.82	2.34	.00	-14.67	-2.97

In short, the results indicate that the two models of DA (i.e., interactionist and interventionist) generated significant positive impacts on EFL learners' SAF. Furthermore, it was revealed that both DA models improved the EFL learners' motivation and reduced their FLCA. Based on the findings, the interactionist DA was more effective than the interventionist DA.

## Discussion

The outcomes of the current investigation are in accordance with the research done by Orikasa (2010). The outcomes of his research showed that interactionist DA in the setting of second-language learning was effective in helping the learners to learn the English language. Moreover, our findings are advocated by Ahmadi Safa et al. (2016), who analyzed the influences of interventionist and interactionist models on Iranian EFL students' speaking capabilities. Their outcomes revealed that both the mentioned models significantly helped the participants develop their speaking skills. Additionally, our findings are in agreement with Malmir (2020) who verified the positive influences of both DA models on the pragmatic knowledge of the students. Furthermore, the findings of the current study are consistent with Malmir's (2020), who confirmed the positive effects of both DA models on students' pragmatic knowledge.

The findings of this paper are also supported by Vygotsky's SCT which states that human activities occur in a cultural environment. In his view, knowledge does not always flow from the more educated person to the less educated one. Learning is a dynamic process in which teachers as well as students are engaged. Correcting mistakes is a social activity in which the student and the teacher collaborate and engage in substantive interactions. Through mediation, the teacher helps students see their mistakes and appropriately rephrase what they wish to say. In order to adjust future education to the students' developing communicative skills, the teacher examines how the students react to the mediation they receive concurrently.

Poehner (2005) asserted that DA is a method in which "instruction and assessment are combined as the tool to move towards an always emergent future" (p. 20). By integrating teaching and assessment, the teachers desire to help EFL learners to conduct over and above their actual capabilities. Learners who cannot conduct by themselves can promote themselves to the next levels of competence by suggesting cooperation, interaction, and mediation. Poehner and Lantolf (2005) maintained that interactionist DA emphasizes the qualitative interpretations of the ZPD. Vygotsky (1978) stated that ZPD is "the gap between the real developmental levels as determined by autonomous problem-solving and the levels of potential enhancement as determined by problem-solving under the guidance of adults or in cooperation with more competent friends" (p. 86). Consequently, it can be inferred that interactionist DA aids the students to achieve their potential abilities that are limited due to a few impediments. Interactionist DA attempts to eliminate those impediments by requiring the mediators to supply the needed mediations for the students and assist them to understand their potential abilities. These statements can, to some extent, be the justification for the outcomes of the present investigation.

More importantly, while both methods, i.e., interventionist DA and interactionist DA, had constructive impacts on prompting the students' speaking skills, as the findings of the research revealed, the interactionist DA method generated more positive effects on developing the students' SAF than that of the interventionist method. The better performance of the interactionist class over the interventionist class can be explained as follows.

Interactionist DA follows Vygotsky's dialoguing collaboration. In this model of DA, help is provided via the interactions between the students and mediators and is subsequently highly responsive to the learners' ZPD. On the other hand, interventionist DA is more highly linked to psychometric considerations of plentiful static modes of assessment. Considering this feature of interventionist DA, Orikasa (2010) stated that statistical methods such as psychometric exams are not successful in demonstrating a complete picture of learners' potential. He also asserted that to gain a comprehensive picture of learners' potentialities, two important pieces of information are needed: the learners' performances with help from the mediators and the degree to which the students can improve. Additionally, Luria (1961) suggested that much attention should be paid both to the diagnoses and prognoses of the developmental potential of the students.

Moreover, interventionist DA uses standard administration scales and sorts of assistance to produce exact outcomes that can be applied to contrast and compare other scales within and among groups and to foresee the performances of the pupils



in other activities. From these statements, it can be inferred that the DA interactionist model is more connected to the fundamental principles of the DA and, thus, it is more effective than the interventionist method.

Besides, Poehner (2009) argued that the self-correction in DA indicates that the students are managing their performances during oral production activities, which is an indication of high cognizance of the spoken forms and high control over the particular features. One more justification for the better performance of DA classes is that the mediation suggested by prompts and hints during DA-oriented sessions can be useful in rising students' cognizance and ultimate control over the particular features that lastly result in their internalization of knowledge. This is also advocated by Poehner and Lantolf (2008) who postulated that DA is not to be used to easily guide students to the right answers, but it intends to support them in taking in the conceptual knowledge they may depend on the future self-regulated efforts. Poehner (2009) argued that mediators' accountability is behind mere noticing learners' autonomous performances as is the case with NDA procedures, as they engage themselves in tasks as co-participants with students.

This is also partly advocated by Glaspey and Stoel-Gammon (2007), who highlighted the significance of a supportive developmental and dyadic atmosphere widespread in DA settings. The supportive atmosphere dominant in G-DA groups observed in the current research was both due to the positive help, mediations, and interactions suggested in peer-peer and the teacher-student mediations. While it may be thought that peers do not have the knowledge to properly mediate the other students' improvement, researchers have confirmed that even coequal peers may be capable of serving as efficient mediators (Ahmadi Safa *et al.*, 2016; Khatib & Ahmadi Safa, 2011).

Another justification for the results is that the interactionist DA, which is more sensitive to an individual's ZPD (Fulcher, 2010), may be a more effective way to account for the psychological processes involved in learning and a more potent way to identify the best types of mediation and teaching (Poehner, 2008). Through meaningful negotiation and mediation, interactionist DA can support teachers in providing students with the right sorts of feedback and help learners identify the root causes of their linguistic difficulties.

A reasonable explanation for both DA groups' anxiety decrease may be the friendly situation of DA classes in which students feel safer and profit from an emotionally safer situation. This is in accordance with Fariadian *et al.* (2014) and Estaji and Farahanynia (2019) who asserted that integration of DA in classes is followed by a reduction in fear of anxiety and failure, for the L2 assessments become less menacing and more student friendly. Haywood and Lidz (2007) stated that DA does not compare the students by norm-referenced interpretations and that the individuals' level of enhancement is evaluated at intrapersonal levels by benchmark-referenced interpretation patterns. This may justify the relative reduction of DA groups' learning anxiety. Furthermore, the students' FLCA increase in DA groups may be ascribed to the effects of group work which is a usual task type in DA. According to Liu and Jackson (2008), a lack of foreign language knowledge can generate anxiety. Consequently, adjusting mediation via the use of DA can assist students to handle their anxiety.

7 The DA groups' anxiety decreased in comparison with the traditional group. The findings of the paper are in conformity with Rahmaty and Zarei (2021), who confirmed the constructive effects of DA models on reducing EFL students' FLA. These results are supported by the previous research verifying the positive effects of DA on decreasing FLA (e.g., Estaji & Farahanynia, 2019; Sohrabi & Ahmadi Safa, 2020). These findings are also in line with Kang (2005) who suggested that making a friendlier learning situation can lessen anxiety. Based on Bahador and Hatami Mofrad (2020), DA connects assessments to instruction that can reduce students' test anxiety. Similar to this study, Lantolf and Poehner (2011) asserted that interactionist DA is more harmonious with the ZPD of Vygotsky and, therefore, is more practical in identifying students' problems and decreasing their emotional difficulties such as FLA. Furthermore, the analysis showed that the results of this study do not reconcile with Worde's (2003), who stated that error correction and evaluation provoke the students' anxiety. Such claims suggest that DA can produce negative effects on the anxiety of students. Finally, concerning the more important effect of interventionist and interactionist DA on decreasing FLA in comparison to the traditional instructions, it can be stated that both methods of DA can generate a more facilitating atmosphere and a friendlier situation in addition to concerning students' abilities and differences and thus assist them to lessen their anxiety (Harding *et al.* 2015).

### Conclusion

The current paper attempted to investigate the impacts of two main models of DA, i.e., interactionist and interventionist models, on enhancing the SAF of Iranian EFL students. Besides, the possible existence of any differences between the impacts of the two DA models on the students' FLLM and FLCA were also examined. The results revealed that both models of DA not only enhanced the EFL learners' SAF and FLLM but also decreased the FLCA. The paper demonstrated that speaking instruction, FLCA, and FLLM ought to receive much attention in our EFL classrooms, and more effort and time should be put into developing speaking skills and their sub-skills. Students ought to be at the forefront of the learning process and try more to master their speaking skills. Students should be given more chances to practice the speaking skill in a way that not only motivates interactions with their peers and teachers but also facilitates the reception of help from them. It is analytically evidenced that DA and its models can accomplish the above-stated objectives, which recommend that English language instructors and material designers have to take EFL settings features and the EFL students' needs into consideration. Although in a classroom all the students with various abilities conduct similar activities, applying DA, all students can profit from proper help based on their necessities.

### Implications, recommendations and limitations

These results can generate some implications for educators, students, and material designers. As Poehner and Lantolf (2010) stated, DA has significant implications for language learning. DA principles can shed light on L2 learners' emotions in addition to their skills. Regarding psychoanalysis, DA can decrease anxiety-related learning problems for students. Because DA can reduce FLA, it can be beneficial for language

learners. Additionally, it might give them more independence. Additionally, DA permits cooperative learning, in which the assessor and the learner collaborate to overcome the challenges of learning (Poehner & Lantolf, 2010).

According to Harding *et al.* (2015), DA helps teachers classify students according to their genuine levels of ability by taking into account the disparities in their performance, in addition to offering insights into learners' skills. Therefore, it is advised that teachers use DA to enhance students' talents and lessen their FLA.

This research may also have consequences for those who create materials. They can create exercises that aid in learning and assessing students. In this approach, in addition to taking pleasure in the learning process, students can gain from awareness-raising assignments and enhance their autonomy. On the other hand, teachers can profit from the mediating jobs and employ them as a supplement to their education and assessment procedures.

As this research worked on only 78 participants, it is recommended that further studies are suggested to include more participants to gain more reliable results. Only upper-intermediate learners were selected to be the participants of this research; other researchers are recommended to work on other language proficiency levels. We could select students with an age range from 17 to 21; future studies can work on different age ranges. Further, researchers are recommended to examine the effects of interventionist vs. interactionist models of DA on other language skills and sub-skills.

#### Abbreviations

BIM	Brown's interventionist model
CG	Control group
DA	Dynamic assessment
EFL	English as a foreign language
EG1	Experimental group
EM	Extrinsic motivation
FIM	Feuerstein's interactionist model
FLCA	Foreign language classroom anxiety
FLLM	Foreign language learning motivation
GDA	Group dynamic assessment
IM	Intrinsic motivation
OQPT	Oxford Quick Placement Test
SAF	Speaking accuracy and fluency
SCT	Vygotsky's sociocultural theory
ZPD	Zone of proximal development

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#### Authors' contributions

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**Availability of data and materials**

The authors confirm that the data supporting the findings of this study are available within the article.

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