



Impact of Dynamic Assessment on the Writing Performance of English as Foreign Language Learners in Asynchronous Web 2.0 and Face-to-face Environments

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Abstract

This study sought to investigate dynamic assessment (DA) - an assessment approach that embeds intervention within the assessment process and that yields information about the learner's responsiveness to this intervention - and the writing performance of the second language (L2) learners in Web 2.0 contexts. To this end, pre and post-treatment writings of 45 participants were analyzed to examine the impact of asynchronous collaborative computer mediation and face-to-face collaborative mediation on L2 learners' writing performance. Three textual features of syntactic complexity, vocabulary complexity, and quantity of the overall information conveyed in the learners' pre and post-tests served as the basic units of analysis. The findings of the present study indicated that using blogging as a Web 2.0 tool to provide mediation contributed more to the enhancement of the overall writing performance. Moreover, the asynchronous collaborative computer mediated group, as compared to the face to face mediated group, showed significant improvement in the vocabulary complexity, syntactic complexity, and quantity of overall information presented in a single paragraph. The findings of the present study also revealed that DA procedures were applicable via Web 2.0 tools and were advantageous to L2 learners' writing performance suggesting that L2 practitioners and instructors should dynamically consider the integration of Web 2.0 technology into L2 writing courses.

Keywords: Asynchronous collaborative computer mediation, Dynamic assessment, Process writing, Syntactic complexity, Vocabulary complexity

INTRODUCTION

During the past several years, there has been a change in English as Foreign Language (EFL) writing instruction i.e. the product and process approach to writing. Despite the recent widespread use of EFL process writing, the number of

empirical research studies about the assessment procedure of writing as a process is limited (Xiaoxia, & Yan, 2010). The empirical studies of writing assessment are restrained to one assessment method across either all stages of writing process or several assessment methods in one stage of writing process. Some other studies (e.g. Ableeva, 2010) examined the modified assess-

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ment methods of EFL writing assessment, e.g., peer assessment and self-assessment.

While traditional assessment aims to summarize students' learning at some point (e.g., at the end of the course), DA looks for the immediate and contextualized feedback to assist the instructor and the learners during the learning process (Lantolf, & Poehner, 2013). DA stems from the reciprocally constitutive relationships between methodology and epistemology. It is deeply rooted in the theory of Vygotsky's sociocultural theory (SCT) of mind (as cited in Poehner, 2008). Vygotsky's SCT advocates the primacy of social constructivist theory in which social interaction is the main thrust in language development. Social constructivist theory is chiefly applied to address the learning through social interaction as represented by the much-heralded concept of zone of proximal development (ZPD), which is the distance between one's actual cognitive capacity and the level of potential development through mediation or scaffolding (Poehner, 2008). Subsequently, under collaborative conditions learners reveal certain emergent functions, which have not been yet fully internalized or have not been part of ZPD.

As such, DA is a way of assessing the true potential of learners, which takes the interactive nature of leaning into the process of assessment. The instructor and the learners enter into dialogues to catch on the learners' existing level of performance on any task and share with each other the possible ways in which that performance might be enhanced in the future. This pre-arranged mediational instruction and the assessment become a continuous process (Lantolf & Poehner, 2004, 2011; Poehner, 2008; Poehner & Lantolf, 2013).

DA is neither an assessment tool nor a method of teaching but a framework for conceptualizing teaching and assessment as an integrated activity of traditional assessment. It is an interactive approach to undertake the assessment that follows a test-intervene-retest format. This approach focuses on the learning processes and modifiability. It provides the possibility of direct linkage between

assessment and intervention through focusing on the ability of the learner to respond to intervention (Heywood & Lidz, 2007).

Dynamic assessment (DA) has several advantages over non-dynamic types of assessment. One of the DA's advantages is that it provides a plenty of information about learners' abilities. DA reveals the degrees of knowledge that learners gained at certain points of instruction. As such, it provides instructors with means of identifying those learners who have trouble with learning. In addition, DA enables instructors to provide detailed descriptions of the abilities of these learners so as remedial programs can be planned (Lantolff & Poehner, 2011).

Another advantage of DA is that it increases the number of opportunities for learners to interact with the instructor via both mediation and feedback (Lantolf & Poehner, 2013; Shrestha & Coffin, 2012). Unlike the traditional summative assessment, DA is more suitable for process writing because in DA the instructor's major role is to promote and to provide immediate and situated mediation during the whole procedure. Both verbal and written feedback are effective tools if provided while learners are in the process of writing drafts and revising them. Comments made by the instructor and the peers on learners' writing drafts, provide learners with information about the clarity and impact of their writing. When learners receive feedback while they are drafting, they are more apt to use that feedback to revise their drafts. In addition, they have an immediate chance to examine the comments in their writing, which may lead to a meaningful application of what they have learned from the feedback. In fact, this learning phase is one of the concepts that distinguishes DA from other forms of assessment.

This study investigated the applicability of DA procedures to the assessment of writing performance in Iranian EFL settings via Web 2.0 asynchronous collaborative computer mediation (ACCM) using blogging. If one endorses the Vygotskian view of cognition, and if the aim of education is to improve the learners' cognitive

development, the logical conclusion is that assessment and instruction cannot be separable. Instructors need to interact with individual learners in the process of performing a task to enable themselves to manage the task when they cannot do so on their own and discover those hidden abilities that learners may use in the future.

DA takes on significant meaning when considered in Iranian context, where tests are still used as a single information-gathering tool to make judgments about individual learners. In a country like Iran, where in-depth empirical research on DA still appears to be limited, doing further research zeroing in on DA appears to be necessary.

By integration of assessment with EFL writing instruction based on blogging, the researchers' aim was to determine the usefulness of using weblogs to enhance L2 writing skill by providing learners with a space to reflect on what has already been covered in class, mediate one another, engage in writing, and to express themselves. The researchers also suggested some implications to the EFL practitioners about using weblogs in the L2 classroom within DA framework in educational contexts.

An Overview of Dynamic Assessment

Dynamic assessment (DA) resides in Vygotsky's notion of zone of proximal development (ZPD) and emphasizes the unity of assessment and instruction with the goal of learners' development. DA proposes that mediation of the examinee's performance is an integral part of the assessment process (Lantolf & Poehner, 2004). In general, DA follows a test-teach-retest format over a period of several weeks. Although models of DA vary, most share the incorporation of a test-intervene-retest format, as well as a focus on learner modifiability and on underlying meta-cognitive processes that facilitate learning. The role of the assessor as an active interventionist, rather than a passive recorder, is also a common ingredient (Poehner, Zhang, & Lu, 2015).

The core to any DA approaches is mediation. In effect, what makes DA approaches different

from one another is how they conceptualize mediation. While some of DA approaches employ a flexible approach to examiner-examinee interactions, some others provide mediation.

Lidz and Gindis (2003) argue that two fundamental points of difference exist between DA and non-DA approaches. The first point of departure is the purpose for which the assessment is conducted. In DA, instruction, assessment, and mediation are inseparable activities. In essence, the main goal of assessment is to promote development.

In the same vein, Poehner, Zhang, and Lu (2015) maintain that the integration of assessment and instruction leads to test-takers' learning during assessment. This is recognized as instrument decay in the assessment literature, which poses a problem for test reliability. However, the counter-argument is that DA and non-DA approaches do not fall on a continuum, as they are epistemologically different. DA approaches aim at understanding examinees' skills, promoting development of their skills, and predicting examinees' future course of development, whereas the goal of non-DA approaches is to determine and measure the current abilities of examinees. In other words, the difference between DA and non-DA approaches is not a matter of instrument but a matter of purpose and procedure.

The second point of difference between DA and non-DA approaches is how the abilities underlying the procedures are viewed. From the DA perspective, individuals' abilities can be completely assessed on condition that the examiner collaborates with examinees during the completion of assessment tasks. In fact, DA transforms the examiner-examinee relationship to that of the mediator-learner's with the mediator intervening during the assessment through providing learners with help ranging from implicit (e.g. prompts) to explicit (e.g. explanation). Deeply rooted in socio-cultural theory, which advances that the development of higher psychological functions takes place via social interaction, DA holds that collaboration with the examinee is necessary for prompting and assessing development.

An intensive review of the related literature reveals that the majority of studies investigating the effects of DA in ESL focus on listening and speaking skills. Shrestha and Coffin (2012), however, studied the effectiveness of instructor text-based mediation in academic writing contexts. The outcome of their study showed that DA helps instructors to find areas that learners need the most support and that DA contributes to learners' writing enhancement.

Birjandi and Ebadi (2012) studied the scaffolding aspect of DA during the instruction of the writing process. The outcomes of their study specified that teaching in a dialogic manner was advantageous to the learners' learning interest and enhancement of the writing competence. The framework they used was developed with the goal of integrating the assessing and assisting aspects of DA.

Alavi and Taghizadeh's (2014) study showed that DA positively contributed to the L2 learners' development of writing skill. Their study showed that the expert/novice interaction led to the substantial improvement of their participants' writing performance as demonstrated in their third and fourth essays. Alavi and Taghizadeh concluded that the mediation provided by the instructor paved the way for the learners to move from other-regulation to self-regulation.

Lantolf and Poehner (2011) investigated the effects of implicit and explicit feedback/mediations in forms of verification and elaboration on ESL writing. Their findings indicated that both types of feedback have positive impact on the learners' writing performance. In another study, Lantolf and Poehner (2013) developed a DA computerized framework for English writing instruction. Their outcome proved that mediation in form of interactions was beneficial in enhancing learners' writing performance.

Computer-Mediated Communication in EFL/ESL

Computer-mediated communication (CMC), as a process by which people create, exchange, and perceive information using networked telecom-

munications systems, has technologically revolutionized the means of knowledge production and delivery (Warschauer, 1996). From a socio-cultural perspective, CMC, with the high interactivity of its communication capacity, is not only a tool but also a medium of social interactions. Thorne (2008) holds that CMC shapes social communities, within which diverse interactions take place and thus provide ample collaborative learning opportunities for L2 learners.

One of the emerging technologies that allow L2 CMC is Web 2.0. As a paradigm shift in the manner by which the long-established World Wide Web (retroactively referred to as Web 1.0) is used, Web 2.0 refers to the Read-Write Web which empowers Internet users either synchronously or asynchronously to generate their own ideas rather than merely reading someone else's and thus fostering greater collaboration among them (Thomas, 2009). Warschauer (2004) maintains that learning English through computer-assisted instruction and becoming computer literate through learning English is a trend in many ESL/EFL learning and teaching programs in many countries across the world.

Asynchronous Model of Teaching L2 Collaborative Writing

Asynchronous model of collaborative writing allows for delayed interactions between the instructor and learners and among learners. In this way, learners have enough time to uncover what is learned. As such, it provides learners with more time to brainstorm ideas, read, understand, reflect, edit, and respond to the written texts of the instructor or peers.

Warschauer (1996) found that asynchronous interactions led to more syntactically complex texts as demonstrated by the use of subordinate clauses and longer sentences that are indicative of active cognitive processes involved in text construction. Related literature indicates that asynchronous interactions provide learners with more time to construct text, thus enabling learner writers to prepare responses. This, in turn, encourages learners to think more critically and focus

on both meaning and form than during the synchronous computer-mediated communications (Beauvois, 1997; Warschauer, 1999; Warschauer, 2004).

Moreover, asynchronous writing instruction benefit the L2 learners (Ableeva, 2010; Montero-Fleta, & Pérez-Sabater, 2010). First, they can receive instruction when and where it is most appropriate for them. This puts less pressure on learners to instantly respond and/or reflect on the information and provides them with more time to process information. Still, another advantage of asynchronous writing instruction is that it is possible to collaborate through a variety of tools including e-mail and blogs, asynchronously.

Text Construction

T-units. The concept of T-unit has long been examined as one of the primary constructs in the learners' writing (Grabe & Kaplan, 1996; Hunt, 1965) and has been used by the first researcher of the present study, the instructor, for the analysis of the text surface level. Hunt (1965) defines a T-unit theoretically as "the main clause of a sentence including the subordinate clauses" (p. 46). Sarieva (2007) defines a T-unit operationally as the average number of words per error-free main clause of a sentence.

Idea Units. An idea unit allows measuring the information that is jammed in a single focus. In other words, an idea unit is linguistic expressions of focuses of consciousness (Chafe, 1980). Chafe suggests that most readable writing shows idea units quite noticeably. Comprehensible writers use punctuation marks to show idea unit. Moreover, Chafe assert that written idea units, compared with spoken idea, tend to be longer; the mean length of idea units produced in spoken discourse is 6-7 words, whereas the mean number of words per written idea unit is approximately 11. Hildyard and Hidi (1985) provide a measurable definition of the idea unit as a clause containing a main verb, subject, and objects plus modifiers.

Vocabulary Complexity. Research on L2 writing confirms that richness of L2 learners' vocabulary immensely affects L2 quality of writing.

Vocabulary is one of the main features of L2 writing and that L2 writing studies need to use scoring methods that rank vocabulary (Santos, 1988; Sarieva, 2007). A number of different measures have been proposed for examining the vocabulary development of language learners. Nation (2001) proposes the Lexical Frequency Profile as a vocabulary scoring method and described it as "the most complete profile that avoids the drawbacks of measures such as lexical originality, lexical sophistication, and lexical quality" (p. 46).

In compliance with what have been discussed above, the researchers aimed to investigated writing assessment in relation to the writing instruction via blogging as a Web 2.0. Consequently, the following null hypotheses were formulated.

- 1- There is no difference between the impact of DA procedures if conducted by means of ACCM and OCM on L2 learners' writing performance.
 - 1.1 ACCM does not affect Iranian EFL learners' writing performance.
 - 2.1 OCM does not affect Iranian EFL learners' writing performance.
- 2- There is no deferential impact between ACCM and OCM on the quality of L2 learners' writing.
 - 1.1 The syntactic complexity of the pre- and post-test paragraphs of the participants does not differ within and between ACCM and OCM.
 - 2.1 The vocabulary complexity of the pre- and post-test paragraphs of the participants does not differ within and between ACCM and OCM.
 - 3.1 The quantity of the overall information in the pre- and post-test paragraphs of the participants does not differ within and between ACCM and OCM.

METHODS

Participants

The present study included one instructor (the first researcher of the present study), two raters,

and 45 undergraduate students in the field of English studies from the Islamic Azad University, North Tehran Branch. The participants had a 105-minute English writing class each week and overall they attended the academic paragraph writing class for 16 weeks. The participants included male and female Persian native speakers (their age range was 19 to 31 years).

Instruments

To ensure the homogeneity of the participants' level of language proficiency, a sample of Oxford Placement Test (OPT) was administered. The OPT, developed by Oxford University in collaboration with the University of Cambridge ESOL Examinations, has 60 multiple-choice questions with each question carrying one mark, giving a total of 60. The time allowed to complete the test is 30 minutes. In the current study, the reliability of the test was 0.80 as estimated by Cronbach's Alpha.

Before the inception of the instruction, both OCM and ACCM group members took a paragraph-writing pre-test to measure their baseline writing performance. In addition, a paragraph-writing post-test was administered in the 16th session to verify the effect of the treatment. Three topics were chosen for each of the pre- and post-

tests from among which the participants were to choose one that interested them the most. The pre-test topics included their favorite national holiday, their favorite course, and their favorite city they like to travel. The post-test topics included the uniqueness of their hometown, description of a famous person or statue in their country, and the benefits of learning a foreign language. The pre- and post-test topics new to the participants i.e. the topics were not discussed during the semester. The participants were instructed to write a paragraph with a clear topic sentence, minimum two major and two minor supporting sentences, and a clear concluding sentence.

Furthermore, the ACCM group was given written instructions for blog assignments. To smooth the process of collaborative work among both ACCM and OCM groups and to assign them to work collaboratively, the instructor introduced what they were required to do and involved both groups in discussions about the advantages of collaboration. Prior to the first online session, three different types of weblog, namely, tutor weblog (TB), class weblog (CB), and learner weblog (LB) were created. Table 1 below summarizes the types of weblog used in the present study and presents their functions.

Table 1.
Types of Weblog and their Functions Used in the Present Study

Type of Weblog	Run by	Functions/Usage
TB	The instructor	Provided: 1- Instructions 2- Follow-ups on difficult areas of work covered in online sessions 3- Guidelines to assignments 4- Upcoming topics of instruction
CB	The participants and the instructor	Used each week by four participants to post their assignments
LB	Each participant	Individually used for practicing writing and posting assignments

Procedure

The OCM group attended the class, but the ACCM group met online once a week. The online sessions served as instructor-controlled

teaching sessions in which online instruction was given.

As for the mediation, the revised version of the regulatory scale designed by Aljaafreh and

Lantolf (1994) was used in this study. Based on this scale, mediation was ranged from implicit to explicit and took form of both instructor-initiated

and peer-initiated prompts. Table 2 below compares medium of delivery of instruction and mediation for both OCM and ACCM groups.

Table 2 .

Differences in Medium of Delivery of Instruction and Mediation for ACCM & OCM Groups

Procedure	ACCM	OCM
Pre-test	administered in the first online session on CB	administered in the first class session paper-based
Instructions	on TB and in an online session	in a conventional classroom
Assignments	pre-writing tasks on CB and LBs sentence/paragraph writing tasks on CB and LBs post-writing tasks on CB and LBs	pre-writing tasks in a conventional classroom sentence/ paragraph writing tasks on paper post-writing tasks on paper
Mediations	instructor and peer mediation via CB and LBs written corrective feedback on CB and LBs	face-to-face instructor and peer mediation in a conventional classroom written corrective feedback on papers
Post-test	administered in the 16 th session on CB	administered in the 16 th session paper-based

To operationalize DA procedures, the instructor adopted Xiaoxia and Yan (2010) framework of DA with features of EFL process writing.

Table 3 below summarizes the DA framework used in the present study.

Table 3

DA Framework of EFL Process Writing (adopted from Xiaoxia and Yan, 2010, p. 29)

	Assessment Steps			
	Pre-task	Mediation	Post-task	
Writing Stages	Choosing topics	Assigning task & independently choosing topics	Dialogues & mediational moves	Independently modifying selves' topics again
	Generating ideas, outlining, & structuring	Independently generating ideas & structuring	Dialogues & mediational moves	Independently modifying selves' structures again
	Macro- & micro- revising	Independently writing drafts	Dialogues, mediational tools moves	Independently modifying selves' drafts again

Additionally, the instructor adopted Poehner (2008) typology for tutor and learner mediation moves of advanced French learners' speaking skills. However, since Poehner's study was

developed for face-to-face interactions and thus was different to the present study, this typology had to be modified in order to reflect the different modes of communication (as in Table 4 below).

Table 4.**Poehner's Mediation Moves**

Mediation Moves		
Providing example	Request for re-narration	Asking for explanation
Accepting response	Offering a choice	Providing explanation
Request for repetition	Specifying error	Providing correct response
Request for verification	Metalinguistic clues	Identifying specific site of error
Reminder of directions	Translation	Helping move narration along

A chain of pre-task, mediation, post-task was used for each of the stages of process writing in the present study as discussed below.

Stage I: Choosing topic. This stage intended to assist the participants in generating writing topics through the instructor's mediation. For generating preliminary ideas, the instructor employed brainstorming technique. This stage started by the instructor's giving the participants a broad topic and instructing them to narrow it down to a more specific one. Then, for the pre-task ring, the participants worked on their own to find a unique topic worth writing. To do so, mind mapping was used as a visual way of brainstorming. The participants literally drew a tree with the stem, branches, and twigs and put the topic in the stem, then put the ideas to the branches or twigs consistent with their relations.

For the mediation ring, the instructor started dialogues with the participants to negotiate the topic with them and encouraged peer negotiation on the topic. The instructor also asked the participants to go over their branching in pairs in the classroom for the OCM group and in the LB for the ACCM group. Next, both groups were to generate ideas for their own topics by drawing a mind map, which was reviewed and commented on, by the instructor and the other participants.

For the post-task ring, the participants were encouraged to modify their topics using the experience they gained through mediation provided by both the instructor and their peers.

Stage II: Generating ideas, outlining, and structuring. In this stage, DA was operationalized by the instructor's providing instruction on how to generate ideas and structure them into an outline. She provided the participants with some tasks to generate ideas and modify the writing

topic if necessary. Next, the instructor assigned for the participants to make outlines for their paragraphs according to their own topic. Then, the instructor discussed participants outlines with them and encouraged peer negotiation on other participants' outlines. Next, the participants were instructed to modify their outlines based on the mediations they had received.

Finally, the elements of a pedagogic paragraph, namely, the topic sentence, major supporting sentence, minor supporting sentence, and closing sentence was introduced. As the final step in this stage, the participants drafted their paragraph according to their mind map and outline.

Stage III: Macro- and micro-revising. Once the participants finished drafting, there came the stage of revising with macro revising at the outset and micro revising soon after. In the pre-task ring, the instructor's concern was to identify major problems in the participants' first draft with regard to subject, audience, and purpose to generate logical coherence. To this end, the instructor shared a sample paragraph with both groups and explained why it was considered an acceptable paragraph in terms of content and organization.

The instructor incorporated Feuerstein's three mediated learning experience attributes (Poehner, 2008), namely, intentionality, reciprocity, and transcendence in the analysis of the sample paragraph.

Intentionality. In order for the participants to understand the criteria of a good paragraph in terms of content and organization and also to be able to improve their drafts in content and in organization, the instructor took several activities from Writing to Communicate 2; Paragraph and Essays, 3rd ed. (Boardman & Frydenberg, 2008).

Moreover, the difficulty level of the sample paragraphs was moderated by focusing on the two aspects of difficulty level and content in order to adjust the activity level to the participant's ZPD. The sample paragraphs were selected from the written productions of learners from the participants' upper grade. As for the content, it was related to the topic already discussed among the group in stage II.

Reciprocity. In this study, the interaction between the participants and the mediator (the instructor) as well as peers was emphasized. To maximize interactions, situated dialogue was used in the process of sample paragraph analysis.

Transcendence. In order to enable learners to write a well-organized and rich-content paragraph on their own in the future, the instructor recapped what was learnt in various ways including restating the whole activity in form of summarizing its main points. The summary consisted 'we' statements (linking the past experience to the present), literal recap (including a summary of the immediate objective of the activity), and

reconstructive recaps (indicating the transcendence of the concrete learning). To wrap up the macro-revision phase, the participants were asked first to start their individual and then their peer revision.

In the micro-revision phase, the instructor employed an expert- and peer-response technique via which language choice, syntax, and grammar were reviewed. The objective of micro-revision for this study was clarity; that is, to write paragraphs that could be read and understood in one reading. The micro-revision phase focused on proofreading for grammatical, typographical errors, and checking for redundancy and consistency of tone or level of formality. This phase also focused on replacing some passive verbs with more descriptive action verbs and improving the syntax of sentences and phrasing.

Finally, the participants were assigned to rewrite their original draft by responding to revisions through proofreading and editing their first draft. The Table 5 below shows the design employed in the current study (i.e. experimental design).

Table 5.
Design of the Study

group	pre-test			post-test		
	Overall writing performance	syntactic complexity	voc complexity	Overall writing performance	Syntactic complexity	Voc complexity
ACCM			overall quantity of info. presented			overall quantity of info. presented
OCM						

DATA ANALYSIS

To ascertain that the sample included only participants who had the same language proficiency, only those who scored one Standard Deviation (SD) above and one SD below the mean on the OPT were included in the study. The mean obtained was 40.79, and the SD was 11. Those who scored below 30 and above 52 were excluded from the study. Out of 97 English sophomores who had enrolled in three Advanced Writing classes, 58 participants were homogenous in terms of their language proficiency and were randomly categorized into

two experimental groups of OCM and ACCM. However, due to data attrition, only the data gathered from 45 participants were analyzed in the present study.

The participants' pre and post-treatment paragraphs were normalized and later scored by two independent raters: the instructor and a Canadian ESL writing instructor who was trained by the first writer of this paper. Spelling and ambiguity normalization were the two procedures used in the present study. For spelling normalization, the texts were normalized at word level. The inter-

rater reliability for the raters was found to be 0.98 using Miles and Huberman's ¹ formula. For ambiguity, the texts were normalized at both word and sentence levels. High inter-rater reliability of 94% was achieved.

To answer the first overarching research question, the two raters using the revised version of the rubric of ESL Composition Profile (Jacobs et al., 1981) marked the pre- and post-tests of the OCM and ACCM groups.

As for the criterion-referenced validity of the writing tests, the results of the Pearson correlations (Table 6 below) ran between OPT and pre- and post-tests of writing indicated that OPT had significant correlations with both pre-test of writing ($r(19) = .631$, $p = .000$, representing a large effect size), and the post-test of Writing ($r(19) = .943$, $p = .000$, representing a large effect size).

Table 6.
Pearson Correlations; Criterion Referenced Validity

		OPT
Pre-WR	Pearson Correlation	.631**
	Sig. (2-tailed)	.002
	N	21
Post-WR	Pearson Correlation	.943**
	Sig. (2-tailed)	.000
	N	21

** . Correlation is significant at the 0.01 level (2-tailed).

Concerning the reliability of the writing tests, the pre- and post-test instruments had been examined based on the results of a pilot test ran in a semester prior to the commencement of the present study. The pilot study aimed at validating the scores gained by the multiple-trait rubric used in the present study. For the pilot pre- and post-test paragraphs, the inter-rater reliability for the rubrics scores had been calculated to be 91%.

Following the procedures employed in the pilot test, the pre and post-test paragraphs were marked by the two raters. To secure high reliability of scores, if a score differed by more than 10%, the raters discussed that very paragraph and

came to an agreement. To obtain comparable scores for the statistical analysis, all scores were converted to z -scores and were compared through the parametric tests of independent paired-sample t -tests. Miles and Huberman's (1994) formula was used to calculate the inter-rater reliability for the scores. The inter-rater reliability calculated was 93%.

To answer the second overarching research question, the researchers measured syntactic complexity, vocabulary complexity, and quantity of the overall information of the participants' paragraph writings. Syntactic complexity was measured through T-unit analysis. In this study, both syntactically correct T-units and incorrect but unambiguous T-units (i.e., T-units that had minor grammatical errors but still conveyed the author's thoughts) were analyzed. Vocabulary complexity score was calculated using Automatic Analysis of Lexical Sophistication (TAALES) (Kyle & Crossley, 2014). Quantity of the overall information that the participants presented in their paragraph was measured through the number of idea units. The instructor adopted Hildyard and Hidi (1985) definition of idea units which includes a clause containing a main verb, subject, and objects plus modifiers and measured quantity of the overall information in the participants' writing through measuring mean length of idea units. The measures of syntactic complexity, vocabulary complexity, and quantity of overall information were presented with continuous scores; thus, they were analyzed using three independent t -tests.

RESULTS

A paired-samples t -test was run to compare the ACCM group's mean scores on the pre- and post-test of writing in order to probe the minor null-hypothesis 1.1. The results of the paired-samples t -test ($t(20) = 19.81$, $p = .000$, $r = .97$ representing a large effect size) (Table 7) indicate that the ACCM had a significantly higher mean on the post-test of writing. Thus, the minor null-hypothesis 1.1 was rejected. This is supportive of DA procedures conducted by

1. Number of agreements/Number of possible agreements c = Inter-rater Reliability

means of ACCM and proves that it positively affects EFL adult learners' writing performance.

Table 7.
Paired-Samples Test; Pre- and Post-test of Writing (ACCM)

Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
			Lower	Upper			
			6.167	1.426			

A paired-samples *t*-test was run to compare the OCM group's mean scores on the pre- and post-test of writing in order to test the minor null-hypothesis 1.2. The results of the paired-sample *t*-test ($t(23) = 12.23, p = .000, r = .93$ representing a large effect size) (Table 8) indicate that the

OCM had a significantly higher mean on the post-test of writing. Thus the minor null-hypothesis 1.2 was rejected. In other words, DA procedures if conducted by means of face-to-face collaborative mediation improves Iranian EFL adult learners' writing performance.

Table 8.
Paired-Samples Test; Pre- and Post-test of Writing (OCM)

Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	f	Sig. (2-tailed)
			Lower	Upper			
			4.771	1.911			

Furthermore, an independent sample *t*-test was run to compare the ACCM and OCM groups' mean scores on the gain score of writing (post-test minus pre-test) in order to examine whether there is any difference between the impact of DA procedures if conducted by means of

ACCM and OCM on L2 learners' writing performance. Based on the results displayed in Table 9, it can be claimed that the ACCM had a higher gained mean score ($M = 6.17, SD = 1.42$) than the OCM ($M = 4.77, SD = 1.91$).

Table 9.
Descriptive Statistics; Gain Score of Writing by Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Gain-WR	ACCM	1	6.17	1.426	.311
	OCM	4	4.77	1.911	.390

The results of the independent sample *t*-test ($t(43) = 2.74, p = .009, r = .38$ representing a moderate effect size) (Table 10) indicate that the ACCM was more effective for enhancing EFL adult learners' writing performance. Thus, it was

concluded that ACCM enhances EFL learners' writing performance when compared to face-to-face collaborative mediation. Nevertheless, this should be interpreted cautiously due to the moderate effect size value of .38.

Table 10.
Independent Samples Test, Gain Score of Writing by Groups

	Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	2.035	.161	2.74	3	.009	1.396	.509	.370	2.422
Equal variances not assumed			2.79	42.0	.008	1.396	.499	.389	2.403

Three criteria of syntactic complexity, vocabulary complexity, and quantity of the overall information presented were used to measure participants' language competencies as demonstrated in their pre- and post-treatment paragraphs.

An independent samples *t*-test was run to compare the ACCM and OCM groups' mean scores on the gain score of syntactic complexity (post-test minus pre-test scores) in order to examine null-hypothesis 2.1. The analysis revealed that in the post-treatment paragraphs, the mean

length of the T-units for the ACCM was higher ($M = 4.87$) than that of the OCM ($M = -.06$). The standard deviation of the two groups was also different; for the ACCM it was 3.12, whereas for the OCM it was 4.74.

The results of the independent samples *t*-test ($t(43) = 4.05$, $p = .000$, $r = .52$ representing a large effect size) (Table 11) indicate that the ACCM was more effective for enhancing EFL adult learners' syntactic complexity. Thus, the null hypothesis was rejected.

Table 11.
Independent Samples Test, Gain Score of Syntactic Complexity by Groups

	Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	3.949	.053	4.05	43	.000	4.928	1.217	2.474	7.381
Equal variances not assumed			4.16	40.1	.000	4.928	1.184	2.534	7.321

In addition, an independent samples *t*-test was run to compare the ACCM and OCM groups' mean scores on the gain score of vocabulary complexity (post-test minus pre-test) in order to

probe null-hypothesis 2.2. The results of the independent samples *t*-test ($t(43) = 5.67$, $p = .000$, $r = .65$ representing a large effect size) (Table 12) indicate that the ACCM was more effective for

enhancing EFL adult learners' vocabulary complexity. Thus, the null-hypothesis was rejected.

Thus, it was concluded that ACCM contributes to vocabulary complexity more than what OCM does.

Table 12.

Independent Samples Test, Gain Score of Vocabulary Complexity by Groups

	Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.016	.899	5.67	43	.000	3.515	.620	2.265	4.766
Equal variances not assumed			5.71	42.9	.000	3.515	.615	2.274	4.756

To test the null hypothesis 2.3, the instructor used morphosyntactically correct idea units, as well as idea units that had certain errors but were unambiguous in the context of participants' writings. In the context of the present study, dependent clauses conjoined by a different conjunctions, such as *after*, *although*, *as*, *as if*, *if*, *in order to*, and so forth; *appositives*; and *participial clauses* were considered as separate idea units. Conversely, *restrictive relative clauses*, *indirect questions*, and *indirect quotations* were counted as part of the main clause, thus forming no separate idea unit.

An independent samples *t*-test was run to compare the ACCM and OCM groups' mean scores on the gain score of overall writing quantity (post-test score minus pre-test score) in order to probe null-hypothesis 2.3. The results of the independent samples *t*-test ($t(43) = 6.45$, $p = .000$, $r = .70$ representing a large effect size) (Table 13) indicate that the ACCM was more effective for enhancing EFL adult learners' overall writing quality. Thus, the null-hypothesis was rejected and it was concluded that overall writing quality is much enhanced by ACCM as compared to OCM.

Table 13.

Independent Samples Test, Gain Score of Quantity of Overall Info. by Groups

	Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.006	.941	6.45	43	.000	6.247	.969	4.294	8.201
Equal variances not assumed			6.47	42.6	.000	6.247	.965	4.301	8.194

DISCUSSION AND CONCLUSION

The results of this study showed that both ACCM and OCM environments used to undertake DA significantly enhanced the participants' writing performance across both ACCM and OCM groups. This outcome appears reasonably rational in that DA compares current performance of each individual with his/her earlier performance, makes inferences about each individual's improvement on such grounds, and mediates each individual moving a stage above his/her present level of ability. If on-the-spot mediation is provided, no one remains unaffected and thus his/her ability would advance. These findings commensurate with a number of other studies, including Ableeva (2010); Lantolf and Poehner (2011, 2013), Poehner and Lantolf (2010, 2013), Poehner, Zhang and Lu (2015), Shrestha and Coffin (2012), and Xiaoxia and Yan (2010).

DA procedures employed in the present study placed high emphasis on all of the stages of the process writing, particularly the first two stages (i.e. choosing topic - generating ideas, and outlining, and structuring), which are usually overlooked by most L2 instructors. In the process-oriented instruction, the endeavor made for encouraging writing is a dynamic, continuous, and mutual effort of both the instructor and the learner (Xiaoxia & Yan, 2010). In the present study, the dynamic and mutual effort was made possible via interpreting the potential of the participants (pre-task), the interaction between the mediator (instructor and peers) and the participants, use of language (dialogue), and use of mediational moves. Since the mediation was made in the ZPD of learners, remarkable progress occurred in both groups of ACCM and OCM.

The results of the present study indicated that weblogs provide a favorable environment for delivering focused and tailored-to-the-learners' ZPD mediations. Weblogs have the capacity of providing learners with an environment in which they can interact with one another, share their ideas, build up their knowledge, and enhance their writing performance collaboratively. This complies with an increasing number of studies

which have emphasized the effectiveness of Web 2.0 tools in L2 teaching and testing (Akçay, & Arslan, 2010; Montero-Fleta, & Pérez-Sabater, 2010; Mueller, 2009; Noytima, 2010; Radia, & Stapleton, 2009; Richardson, 2006; Zaini, Kemboja, & Supyan, 2011).

Based on the instructor's observation of the participants' activities in each task during pre-writing, drafting, and post-writing, OCM might be more appropriate for generating ideas as learners engage in oral conversation, providing immediate feedback on one another's brainstormed ideas. This is while ACCM might be more appropriate for organizing these ideas, as well as multi-drafting and revising, since this mode of collaboration provides round the clock access to the outcome of the previous stages in a written form. One might conclude that different modes of collaboration and mediation might mingle to provide a window of opportunities for practicing different stages of process writing.

Moreover, the findings of the current study reveal that participants' knowledge of syntax and vocabulary and the amount of information they presented in their writing is much enhanced by ACCM as compared to OCM. It is abstracted from the data analysis that the ACCM group produced a significantly greater number of error-free T-units than the OCM group. One of the reasons is that the ACCM made it possible for the participants to exercise a higher degree of control over writing mechanisms. It offered the ACCM group more time to prepare posts in form of topic initiation moves or responses to the instructor or to other learners. Asynchrony of collaboration and mediation made it possible for the ACCM group to focus on both form and meaning to a greater extent than the OCM group when generating ideas, planning writing, editing spelling, grammar, and punctuation, and also writing longer sentences and clauses.. The OCM participants' immediate attention was directed toward expressing meaning rather than form thus produced significantly shorter and simple sentences.

The present study possesses limitations associated with time and sample-size. This study was

run over the course of 16 weeks with the last session devoted to the post-test. Bearing in mind that progress in writing skills demonstrable both on the surface--vocabulary and syntactical complexity-- and on deep levels--presentation and development, overall language use, and rhetorical soundness--takes place over long time. As the instructor did not have access to participants once the semester was over, delayed effect of DA on improving the writing performance of the L2 learners was not tested.

Another main limitation of the present study was the sample-size. The difference between the groups (effect size =.38) could be more noticeable with a relatively larger sample size. Conceivably, with a larger group of participants, the study would have had more power to detect a more significant difference.

The present study offers some suggestions for further research. First, the findings of the present study provide some awareness for L2 instructors on the use of Web 2.0 to offer collaborative mediation during planning, idea generation, drafting, and revising stages of process writing. Weblogging is text-based in nature, which enables learners to individually practice and reflect on what has been done previously. Nevertheless, the mode of mediation and collaboration (asynchronous, synchronous, and offline) should be considered in the design of the tasks for each stage. This is because learners participate in the same task completion differently contingent on the mode of collaboration. It would also be worth conducting further research that studies the type of tasks and activities suitable for each mode of communication.

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