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Research Paper

The Effect of Critical Thinking-Oriented Dynamic Assessment on Iranian EFL Learners' Learning Potential: A Study of Reading Comprehension Skill

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Abstract

The present study is part of a Ph.D. program that explores the possible effect of critical thinking-oriented dynamic assessment (CT-DA) on learners' learning potential in reading comprehension skills. 21 Iranian language learners who were homogenized in terms of their language proficiency, reading comprehension, and critical thinking abilities participated in this study. Learners were divided into three groups of CT-DA, dynamic assessment (DA), and Control group. While learners in CT-DA received mediation loaded with critical thinking techniques, learners in DA group received dynamic assessment mediation, and learners in the Control group did not receive any mediation. The analysis of the results revealed that DA and CT-DA significantly improve learners' reading potential scores. Moreover, significant differences between the Learning Potential Score (LPS) of DA and CT-DA groups were found, denoting the better performance of participants who received a critical thinking-

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oriented dynamic assessment. Finally, the qualitative analyses led to the detection of eleven mediational strategies which nurtured the development of the reading comprehension ability of L2 learners during CT-DA. The article concludes with suggestions for further research on dynamic assessment and critical thinking in second/foreign language development.

Keywords: Critical Thinking, Dynamic Assessment, Learning Potential Score, Mediation, Reading comprehension, ZPD

It has been vastly echoed by practitioners and scholars (Aloqaili, 2012; Dörnyei, 2019, Ellis, 2019) that the ultimate purpose of research is decreasing students' mistakes as well as upgrading practices by discovering more efficient ways of learning and finding more practical ways of instruction. Many researchers (e.g., Dornyei, 2019, Lai, 2011; May, 2010; Park, 2005; Smith, 1985) agreed that reading is essential but a difficult skill for English as Second/Foreign Language (ES/FL) students to accomplish. Reading imposes greater demands on the readers as the text lacks immediate feedback from author. Reading is not merely reading word after word in a sentence. The difficulty lies in understanding and organizing the main idea and comprehending the per- and illocutionary meanings.

The present variations in reading theory roots in greater attention paid to cognitive and metacognitive aspects of learning, and this has led to the adoption of dynamic assessment of reading (Poehner & Lantolf, 2013; Poehner, Zhang & Lu, 2015). According to Brwon, Campione, and Day (1981), process rather than product might enhance learners' learning, and this was pursued by studies on strategy instruction (e.g., Oxford, 1993). As a result, dynamic assessment procedures were sparked to both assess and develop learners' reading performance. Among the first studies on

incorporating DA procedure to reading evaluation were that of Cioffi and Carney (1983), Kletzien and Bednar (1990), and Kozulin and Grab (2002).

As Rosiek (2003) notes, "within the current emphasis on high-stakes mandatory testing lurks a corrosive Cartesian assumption, a fantasy of an individual mind that acquires a mastery of certain concepts independent of any emotional, social, and cultural context" (p. 399). In the same vein, Brown and Ferrara (1985) argued that it is possible to facilitate test performance by including a 'psychology tool' and a 'stimulus' with an assessment task. Thus, this study aims to integrate critical thinking and dynamic procedures and investigates their combined effects on learners' reading comprehension. In other words, the main goal of this study is to investigate whether and how one special type of intervention, which is a critical thinking-oriented dynamic assessment procedure, can impact participants' learning potential in reading comprehension.

Therefore, the present study aims to overcome the problems learners have while reading English passages, indicate their weak points, and accordingly give feedback on their performances. In doing so, this study adopts a mix-methods research study incorporating quantitative and qualitative procedures. As for the quantitative part, the effect of integrating the critical thinking concept by Dynamic Assessment to foreign language reading instruction with a focus on learners' learning potential is examined. As an improvement over traditional testing procedures, DA gives a more inclusive approach to the evaluation of learners' underlying abilities (Lantolf, 2009). This leads to the enrichment of assessment practice in EFL/ESL contexts as it can afford teachers with appropriate feedback options. Moreover, the results of this research create a link between cognition and assessment and form a foundation for the incorporation of critical thinking within teaching and

assessment tasks and applying them to enhance learners' performance. As for the qualitative part, the study tries to gain insights into teachers' practices and learners' perception of CT-DA.

According to the objectives of the study, the present research aims to explore the effect of dynamic assessment procedures on learners' learning potential. Moreover, the type of mediational strategies that teacher applies was studied. Therefore, the study will follow the objectives formulating the following research questions:

- 1) Does dynamic assessment procedure have any effect on Iranian EFL learners' learning potential of reading comprehension?
- 2) Does CT-DA have any effect on Iranian EFL learners' learning potential of reading comprehension?
- 3) Which forms of mediation are suggestible for teachers during critical thinking-oriented dynamic assessment (CT-DA) intervention?

Literature Review

Within the theoretical framework, the conceptualization of learning as a socially- and culturally-dependent phenomenon, namely Socio-Cultural Theory (SCT), is among the promising learning theories (Poehner, 2005). This formulation is ascribed to Vygotsky (1978), who held that individuals' learning is both social and cultural. Learning, according to Vygotsky, is thus "successful tailoring of the interaction to the developmental level of individual learners" (as cited in Ellis, 2008, p. 528). Based on this viewpoint, learners use physical, cultural and psychological means to adjust their mental activities in order to improve in their Zone of Proximal Development (ZPD) (Ellis,

2008). Vygotsky (1978) refers to ZPD as "the distance between the actual and potential developmental level".

Dynamic Assessment (DA) is, thus, "designed to bring out the learning potential and improve learning effectiveness by providing learners with a greater number of opportunities to interact with more competent peers and adults, such as teachers" (Wang, 2010, p. 1158). It, further, has "the expressed goal of modifying learner performance during the assessment itself as opposed to obtaining a static measure of a learner's proficiency without feedback or intervention of any kind" (Ellis, 2008, p. 528).

As for the definition of DA, Haywood and Lidz (2007, p. 1) define it as "an interactive approach to conducting assessments within the domains of psychology, speech/language, or education that focuses on the ability of the learner to respond to intervention." By the same token, Sternberg and Grigorenko (2002, p. vii) explain that DA "takes into account the results of an intervention. In this intervention, the examiner teaches the examinees how to perform better on individual items or on the test as a whole".

Unlike static assessment which places more emphasis on the product of prior learning, dynamic assessment is geared towards assessing the process of learning itself. Assessing the intelligence of an individual dynamically allows for the circumvention of many of the potentially spurious and discriminatory challenges typically associated with static intelligence measures. According to Hill and Sabet (2009), there are a number of fundamental differences between DA and non-Dynamic Assessment (NDA) types

First, NDA taps more into a developed state (i.e., intelligence), whereas DA taps more into a developing process (i.e., cognition). Second, in NDA there is no feedback from examiner to test-taker regarding the quality of performance. In DA, feedback is given, either explicitly or

implicitly. Third, the quality of the examiner-examinee relationship is different. In NDA, the examiner attempts to be as neutral and uninvolved as possible to avoid any error in measurement. In DA, the mediator and learner have a two-way interactive relationship. Finally and perhaps most importantly, DA does not separate instruction from assessment. (p. 537)

Studies on DA have been proliferated since its introduction (Sarani & Izadi, 2018; Heidari, 2020); while all previous studies explored interactionist approach to DA, none, to our knowledge, puts explicit emphasis on the learner's critical thinking state. Facione (2007) defines critical thinking as a kind of "reflective thinking" which incorporates in a dynamic and cautious consideration of a belief with a focus on the factors that foster it and its conclusions. Sound thinking, citing Kanik (2010), needs "approaching issues with critical scrutiny and does not allow human beings to commit themselves to beliefs they do not know to be absolutely true because the knowledge they acquire is subject to change under conditions in life" (p. 13). Fahim and Eslamdoost (2014), Davies and Barnett (2015), and Caceres, Nussbaum, Ortiz (2020) stress that critical thinking is an active process as opposed to the passive approach of receiving ideas and knowledge. Accordingly, critical thinkers contemplate things, raise questions and look for information all by themselves.

Based on critical thinking literature, the critical construct is a noticeable tactic by which instructors are able to encourage students to select, plan and apply their potential ability. Unfortunately, as Gatto (2001) asserted, "school, as it was built, is an essential support system for a model of social engineering that condemns most people to be subordinate stones in a pyramid that narrows

as it ascends to a terminal of control" (p. 13). Accordingly, chief attention has been devoted to critical construct in Second Language Acquisition (SLA) area (Leach, Immekus, French & Hand, 2020; Wale & Bishaw, 2020). According to Davies and Barnett (2015), Fahim, Barjesteh, and Vaseghi (2012), and Caceres et al. (2020), background knowledge is one of the important elements in assisting individuals in having reflective thoughts. This Cognitive ability is at the core of rational decisions. In other words, this domain knowledge is among essential skills which are beneficial for educators and students in approaching a better education system. Incorporating better judgment, using inductive/deductive thinking, and solving problems, instructors can help learners in cultivating their skills and strategies, which eventually lead to their better attainments (Fahim & Eslamdoost, 2014, El Soufi & See, 2019; Caceres et al., 2020; Leach et al., 2020).

The inspiration for combining critical thinking and reading comprehension was overshadowed by previous results concerning the impact of critical thinking on reading attainment. In EFL/ESL reading literature, studies investigated the relationship between critical thinking and EFL learners (e.g., Aloqaili, 2012; Yousefi & Mohammadi, 2016; Caceres et al., 2020; El Soufi & See, 2019; Leach et al., 2020; Wale & Bishaw, 2020), and ESP learners (e.g., Zare & Biria, 2018) and the impact of critical thinking on reading comprehension (e.g., Haji Maibodi, 2014; Barjesteh & Vaseghi, 2012; Vaseghi, Gholami & Barjasteh, 2012; Heidari, 2020). In his study, Alogaili (2012) explored the schema theory for the association between reading ability and critical thinking. He reported that there was a positive, strong correlation between reading ability and critical thinking, and schema theory offered a rational premise for that correlation. More recently, Haji Maibodi (2014) found a direct impact of instructing critical thinking on learners' reading

achievement, which resulted in an improvement in learners' 'attitudes, confidence, and interest'. Heidari (2020) argued that while high and low critical thinkers had the same performance in terms of textually explicit reading items, high critical thinkers outperformed lower counterparts regarding textually implicit and script-based reading items. However, as it was mentioned, the literature on the correlation between critical thinking and EFL/ESL learning have used rather standard approaches to assessment and thus exploring the dynamic nature of reading performance and the effect of critical thinking loaded mediation on reading achievement seem to be an ignored area of analysis.

The rationale for investigating the reading comprehension skills of learners through dynamic assessment is founded on the need to focus on process rather than product (Izadi, Khoshsima, Nourmohammadi, Yarahmadzahi, 2017, 2018). In EFL/ESL literature, a number of studies (Fani & Rastchi, 2015; Mardani, 2013; Abdolrezapour, 2017; Mardani & Tavakoli, 2011) found a contributing effect of DA on students' reading achievement.

With respect to the literature on dynamic assessment, reading comprehension, and critical thinking, a number of studies have been undertaken. Navarro and Lara (2017) aimed to evaluate reading among 60 learners who had difficulties in reading comprehension (9-16 years old). Dialogue/participation strategies were applied to provide mediation during reading activities. Findings of the study revealed that "the EDPL device showed a significant incremental validity with respect to the predictions based on the static test of personal-social adjustment" (p. 45). Abdolrezapour (2017) combined emotional intelligence and dynamic assessment to explore their impact on Iranian learners' reading comprehension. She, therefore, assigned 50 learners to three groups: a control group (a regular class of the institute; a

comparison group (a DA group); and an experimental group (an EDA group). Overall, she found that applying EDA procedures focusing on Goleman's emotional intelligence framework to reading assessment tasks made a difference in students' reading comprehension and achievement compared to those who received a pure dynamic assessment in any form. Moreover, her study showed EDA could increase learners' emotional intelligence and could provide information on their learning potential over and beyond what was available from the DA and static testing. In her study, both DA and EDA procedures informed the mediator about specific areas where learners encountered difficulty. Therefore, they led her to detect two inventories of mediational strategies that best nurtured learners' reading comprehension. Abdolrezapour suggested that instructional benefits of EDA found in her study could be helpful for individualizing learning and developing individual learning plans in accordance with learner's needs.

In another study, Mardani and Tavakoli (2011) used interactionist DA to investigate the possibility and realism of growth and application of dynamic assessment to reading attainments of 30 Iranian male students. A multiple-choice reading comprehension test was utilized to check learners' performances before and after the intervention. The results showed that dynamic assessment is more than just a formative assessment.

Ajideh and Nourdad (2012) explored the impact of DA on L2 students' reading attainments regarding different proficiency levels. Applying an interventionist approach, the researchers provided graduated hints to the learners with respect to language proficiency, i.e., low, mid, and high, and assessed their performances in three interval dependent variables, i.e., pre-test, immediate post-test, and delayed post-test. The results of the study revealed that there was no noteworthy difference in the immediate and delayed effect

of DA on students' reading performance regarding language proficiency, i.e., low-, mid-, and high. This means

Dynamic assessment can be beneficial for EFL readers, and its effect remains over time. And learners of low-, mid-and high-proficiency levels improve their reading comprehension ability almost equally, and the proficiency level doesn't affect the amount of taking advantage of dynamic assessment. (p. 118)

In his study, Mardani (2013) taught a set of core Critical Thinking (CT) strategies specific to reading comprehension through implementing interventionist DA procedures to 10 university-level EFL learners. He used the University of Florida's Critical Thinking Inventory Manual to teach and assess the CT strategies of the learners. The findings of his study revealed noteworthy enhancement in students' reading achievement after receiving mediation. His dissertation also revealed that during the DA procedures, the students' performance pattern in critically analyzing a text changed from total reliance on the teacher (i.e., requiring mediational support for CT) to achieving independence in and more disposition towards CT. In addition, he observed that the learners were able to transfer the acquired CT skills to unseen reading comprehension texts. He suggested that "the incorporation of DA as a supplement procedure to standardized testing has positive effects on both the test performance and learning of the students" (p. 78).

Fani and Rastchi (2015) compared the impact of individualized and group DA in terms of reading performance. One hundred twenty-four undergraduate female students participated in the study. Campione and Brown's Graduated Prompt Moves Protocol (GPMP) was used to mediated learners. According to the results, mediation in Concurrent and Cumulative Group DA and

Individualized DA had a positive influence on the language learners' reading achievement. It is worth mentioning that students in the Individualized DA group performed better than the students in Group DA. Despite this, the difference found among the impact of the three dynamic assessment techniques was not noteworthy.

The relationship between critical thinking and EFL/ESL has recently attracted researchers' attention (Kanik, 2010; Menkes, 2005; Vaseghi, Gholami, & Barjesteh, 2012; Mozafari & Barjesteh, 2016; El Soufi & See, 2019; Caceres et al., 2020; Leach et al., 2020; Wale & Bishaw, 2020) and the development of learners' reading achievement through critical thinking activities has been studied in Kamali and Fahim (2011), Yousefi and Mohammadi (2016), Heidari, 2020 and Zare and Biria's (2018) study. Nevertheless, these studies investigated the intervention through standard assessment techniques, and the dynamic nature of learning was rather ignored. Furthermore, the probability of developing language learners' reading comprehension through critical thinking-oriented DA procedure in the EFL context has not yet been studied. The present study aims to fill this gap by assessing how DA, which is based on the critical thinking concept, affect EFL/ESL learners' reading performance. In other words, this study tends to combine critical thinking and dynamic assessment procedure and explore their incorporated impacts on learners' reading comprehension skills. Essentially, the study aims to probe whether and how critical thinking-oriented mediation through dynamic assessment procedure can affect participants' reading comprehension. This dynamic assessment procedure which is based on the critical thinking concept, has the prospective to reveal learners' reading achievement. Finding the state of learners' reading performance might be a very key element in employing suitable reading methods to teach and improve

students' reading abilities. With this knowledge, instructors can direct and possibly enhance learners' improvement through reading techniques and methods. Moreover, teachers can consider creating critically thinking safe learning strategies which learners can take risks, promote efficacy, and enhance critically and intellectually.

The reason for considering dynamic assessment with a focus on critical thinking in the present study lies in the fundamental principles of DA. Dynamic assessment techniques intend to recognize problems students face in order to find more effective learning strategies to eliminate those problems; finally, the effects of eliminating those problems on subsequent learning and performance were assessed. These problems can better be eliminated by considering students' critical thinking abilities and linking these abilities in the learning stage.

Method

Participants

The target population in this study included Iranian EFL learners. The participants were selected from 65 male undergraduate EFL learners from Islamic Azad University, Shiraz Branch. Because the students were the participants that the researcher had access to, a convenience sampling method was applied to select the sample of the study. Then, a general English placement test, namely Oxford Placement Test (OPT), and the reading section of First Certificate English (FCE), were performed in order to make sure that the participants were homogenous with regard to their language proficiency and reading comprehension skill. Furthermore, a critical thinking questionnaire was distributed to select the subjects who had similar critical thinking abilities. Finally, 21 male learners, being at the intermediate level of

language proficiency and reading comprehension skill, were chosen. The learners were between 19 to 22 years old. Learners' mother tongue was Persian and English was their foreign language for one year at university.

Materials and Instruments

These are divided into two parts. Part one includes instructional materials, which consist of the textbook, and the mediational activities. Part two includes assessment materials which consist of the Oxford Quick Placement Test, First Certificate English, critical thinking questionnaire, and the two reading tests that are considered to check learners' actual and mediated performances.

The Textbook: ACTIVE Skills for Reading. The textbook, which was used as the main instructional material, is ACTIVE Skills for Reading 1 (3rd Edition), written by Anderson (2014). The passages are thematically organized non-fiction texts to impart reading comprehension and vocabulary skills. The reason why the study selected this book is that it helps to motivate learners to think and contemplate the texts critically.

Mediational activities. During the eight-session treatment of the experimental group, participants of the CT-DA group were given mediational feedback. This mediation feedback was posed by the teacher to the learners whenever learners faced difficulties. The feedback was not pre-fabricated, rather created in the course of teacher-learner interaction. These mediational activities ranged from implicit hints/prompts to explicit ones. The researcher applied the following typologies to the mediational data of this study. Poehner's (2005, p. 160) typology for tutor mediational moves which was developed in his study of advanced French learners' speaking skills, is shown in Table 1.

Table 1.

Mediation Typology of Dynamic Assessment

- | | |
|-----|------------------------------------|
| 1. | Helping Move Narration Along |
| 2. | Accepting Response |
| 3. | Request for Repetition |
| 4. | Request for Verification |
| 5. | Reminder of Directions |
| 6. | Request for Renarration |
| 7. | Identifying Specific Site of Error |
| 8. | Specifying Error |
| 9. | Metalinguistic Clues |
| 10. | Translation |
| 11. | Providing Example or Illustration |
| 12. | Offering a Choice |
| 13. | Providing Correct Response |
| 14. | Providing Explanation |
| 15. | Asking for Explanation |

Davies and Barnett's (2015, p. 147) framework of critical thinking teaching which is an all-inclusive model of critical thinking in order to enhance students' critical thinking capability, is shown in Table 2.

Table 2.

Framework of Critical Thinking

- | | |
|------------------|--|
| 1. Clarification | a) Questioning: doubting and searching the fundamentals related to the problem.
b) Outline: making a bright sketch of cognitive structure.
c) Authentic evidence: gathering the related and supportive evidence as well as counter-evidence. |
| 2. Judgment | a) Selecting the best and greatly related as well as most supportive evidence.
b) In-depth analysis of the supportive and counter-evidence. |

	c) Considering values, standards, and urgencies as well as noteworthy and vital points.
	d) Exhaustive analysis of the arguments and counter-arguments.
3. Strategies	a) Have a clear definition of the matter at hand.
	b) Distinguishing the very purpose of the issue.
	c) Make adaptations between the purpose and evidence as well as values.
	d) Make value-laden inferences on the basis of previous findings.
	e) Not to claim a definite inference: Have an evolving and iterative rethinking over the issue in order not to propose a fixed deduction.

Oxford Quick Placement Test (OPT). Oxford Quick Placement Test (OQPT, Version 1) was used to indicate the exact language proficiency of the learners before recruiting the participants. The test was developed by Oxford University Press and Cambridge ESOL (Beeston, 2000). Part one (1-40) includes grammar and vocabulary questions, and part two (40-60) contains multiple-choice questions and cloze tests. All questions are in multiple-choice format. Following the guidelines, part one has to be administered first. If the examinees correctly answer more than 35 questions in part one, part two should be given to them. The validity of the test has been proved in 20 countries by more than 6000 participants (e.g., Ellis, 2019; Kanik, 2010; Menkes, 2005). The internal consistency of the test was reported as 0.9.

First Certificate in English. First Certificate in English is an English language test administered by Cambridge Assessment English. The test demonstrates that participants have the language abilities required to interact confidently in an English-speaking context. The Reading section which is extracted for this study, has three parts in which learners read an array of passages and complete tasks that test their reading comprehension:

- Part 1: multiple-choice questions test participants' ability to read for detail, attitude, tone, purpose, main idea, and implication.

- Part 2: fill-gap questions test participants' ability to read for the structure and development of a text.
- Part 3: matching questions test participants' ability to read for specific information, detail, opinion, and attitude.

Critical Thinking Questionnaire. A critical Thinking questionnaire (Naieni, 2005) was employed to check students' critical thinking beliefs and to be assured they were at the same level. The original questionnaire (Honey, 2000) was redesigned for Iranian language learners (Naieni, 2005). The content and construct validity of the questionnaire was studied by Honey (2000) and Naieni (2005). According to their analysis, the questionnaire enjoys a well-defined content and construct validity. The reliability of the questionnaire was also reported as 0.86 (Naieni, 2005). It consists of 30 questions using a 5-point Likert scale which ranged from never to always in terms of learners' critical thinking beliefs.

Reading Comprehension Test. A reading comprehension test provided by ACTIVE Skills for Reading series was used to measure the students' reading comprehension performance before and after the treatment. The pre-test consists of four passages, including 28 multiple choice questions, and the post-test, similar to the pre-test, consists of 4 passages with 28 multiple-choice questions. The tests assessed learners' text interpretation skills, developing understanding and vocabulary knowledge. As for the validity, the tests were examined by two other lecturers in order to check whether they met the criteria of a valid test. The changes were made and the final version was examined by a professor who is specialized in testing and assessment. As for the reliability, the tests were piloted with a group of 32 EFL learners who had the same

characteristics of the sample of this study. The Cronbach α was reported as .95 and .91 for each test, respectively.

Procedure

This study used a quasi-experimental and quantitative and qualitative data collection methods to provide a better picture and understanding of the results. According to Dornyei (2019), quantitative data are collected to examine learners' performance before and after the intervention, and the qualitative data help to provide a deep view of the variables of the study. This study thus involved three EFL classes: Two serving as the experimental groups who received either critical thinking-oriented DA (i.e. CT-DA) or dynamic assessment (DA); and the second group that served as the control group who underwent the traditional way of teaching reading (i.e. control). The treatment for the experimental groups involved an interactionist DA approach.

Table 3.

Research Design of the Study

	Test of Actual Performance	Treatment	Test of Mediated Performance
Experimental group CT-DA	Test of reading comprehension ability	Implementing critical thinking mediation through dynamic assessment	Test of reading comprehension ability
Experimental group DA	Test of reading comprehension ability	Implementing mediation through dynamic assessment	Test of reading comprehension ability
Control group	Test of reading comprehension ability	Implementing traditional method of teaching reading	Test of reading comprehension ability

Two tests (i.e., actual and mediated) were employed to collect quantitative data on learners' reading comprehension. Regarding the qualitative data, all sessions were video recorded in order to transcribe the interaction between the teacher and learners. Following that, qualitative data were collected to indicate the mediational strategies applied by the teacher.

First, the test of Oxford Quick Placement Test, First Certificate in English, and critical thinking questionnaire were administered to find a homogenous group in terms of language proficiency, reading comprehension performance, and critical thinking ability prior to the experiment. After checking the homogeneity of the learners, they were randomly divided into three groups, i.e., the group that received intervention based on dynamic assessment and critical thinking (CT-DA), the group that received intervention in the form of dynamic assessment (DA) and the group that received no intervention (Control). Then students went through eight-week treatment. The treatment included two sessions per week (two hours for each session), and one lesson was covered per session (total 16 lessons). While the control group received no treatment, participants in critical thinking-oriented dynamic assessment (CT-DA) and dynamic assessment (DA) received mediation. The main difference between CT-DA and DA was that although the two groups received treatment, the treatment in the CT-DA group was based on dynamic assessment and critical thinking, while the treatment in DA group was solely based on dynamic assessment.

The mediation in CT-DA went as following: Students first read a reading passage provided to them and answered the questions individually. Then, the teacher/mediator engaged dialogically with learners asking investigative questions to indicate their comprehension of the text and check their answers to the exercises of the reading passage. When there were errors, breakdowns,

and struggles for doing the exercises, the mediator intervened in the process of development. Learners were mediated through interactionist DA in which instructor and learners engaged in an open-ended, one-on-one dialogue during joint activity. A range of various forms of assistance, thus, were provided to learners based on the critical thinking concept in which the instructor encouraged task involvement, motivate logical reasoning, problem-solving, decision making, and focus on self-questioning, formulating hypotheses, and drawing conclusions. It should be mentioned that this intervention was based on Poehner's (2005) mediation typology and Davies and Barnett's (2015) framework of critical thinking teaching (see Figures 1 and 2). The students in DA groups received the same mediation except for the critical thinking part. However, the control group (Control) read the text passage and answered the follow-up questions without any help or intervention from their teacher. Their teacher encouraged them to ask questions whenever they felt they needed help; but no treatment was provided.

Two tests were administrated before (i.e. actual) and after (mediated) the treatment. Learners were asked to read the texts and answered the items. After administering the tests, the data were collected for quantitative analysis to answer the questions of the study. Besides, the classes during the treatment were audio- and video-recorded. The recoded materials, then, were transcribed to explore the techniques of the instructor in experimental groups.

Data Analysis

To answer the first and second research questions of the study, LPS scores were calculated. LPS is calculated through the following formula

$$\text{LPS} = (2 * \text{Mediated Score} - \text{Actual Score}) / \text{Maximum Score}$$

According to Kozulin and Garb (2002), LPS score is divided into three levels:

$LPS \geq 1.0$ as high

$1.0 > LPS \geq 0.71$ as medium

$LPS < 0.71$ as low

Kozulin and Garb (ibid) argued that learners with different LPS need different levels of instructional help in order to promote their abilities. It is noticeable that learners may have similar independent performance but different mediated scores and accordingly LPS indicating different ZPD. That is to say, "learners who performed at the same level independently may in fact differ dramatically with regard to their learning potential, or responsiveness to mediation" (Poehner et al., 2015, p. 12).

Following that, mean and standard deviation and an independent sample t-test were run to check whether exposing learners to dynamic assessment procedures has any significant effect on learners' learning potential score. The results were used to confirm or decline the fourth and fifth research hypotheses of the study.

Finally, in order to answer research question three, teacher's practices in L2 reading classes based on dynamic assessment with reference to critical thinking, the audio and video recorded material were transcribed and coded.

Results

The first research question of the study examined whether dynamic assessment procedures have any effect on Iranian EFL learners' learning potential scores. Table 4.7 tabulates the mean LPS scores of the learners. To diagnose and give insights into learners' independent and mediated performances, learner responsiveness to mediation should be calculated i.e., LPS. According to Kozulin and Garb (2002), the LPS score is divided into three levels:

- $LPS \geq 1.0$ as high
- $1.0 > LPS \geq 0.71$ as medium
- $LPS < 0.71$ as low

Table 4.

Descriptive Statistics of DA Learners' LPS

	N	Minimum	Maximum	Mean	Std. Deviation
LPS DA	7	.79	1.07	.9433	.08698
Valid N (listwise)	7				

The DA learners showed a medium mean LPS score ($M=0.94$, $SD=0.86$). Table 5 demonstrates each individual's actual and mediated performances and LPS. As Table 5 shows, the LPS ranges from 0.79 to 1.07. It is noticeable that learners may have similar independent performance, but different mediated scores and accordingly LPS indicating different ZPD. That is to say, "learners who performed at the same level independently may in fact differ dramatically with regard to their learning potential, or responsiveness to mediation" (Poehner et al., 2015, p. 12). For example, learners 3, 4, and 5 have similar actual scores (14), but with mediation, learners 3 and 4 scored 18 and 20, showing a medium LPS of 0.79 and 0.93, and learner 5 scored 21, demonstrating a high-range LPS of 1. Regarding this difference, it can be noted that although the three learners demonstrated similar independent performance, they need different degrees of instructional help as they continue to develop their reading comprehension skill.

Table 5.

The Scores and LPS of Learners in Dynamic Assessment Group

Learners	Actual performance	Mediated performance	LPS
1	10	18	.93
2	20	25	1.07
3	14	18	.79
4	14	20	.93
5	14	21	1.00
6	12	19	.93
7	13	20	.96

The findings of this section revealed that the dynamic assessment procedure does not have any effect on Iranian EFL learners' learning potential scores.

The second research question of the study examined whether CT-DA procedure have any effect on Iranian EFL learners' learning potential score. Table 6. tabulates the mean LPS scores of the learners ($M=1.12$, $SD=0.15$).

Table 6.

Descriptive Statistics of CT-DA Learners' LPS

	N	Minimum	Maximum	Mean	Std. Deviation
LPSCTDA	7	.93	1.29	1.1271	.14110
Valid N (listwise)	7				

Table 7. demonstrates each individual's actual and mediated performances and LPS. As Table 7 shows, the LPS ranges from 0.93 to 1.29. It is noticeable that learners may have similar independent performance, but different mediated scores and accordingly LPS indicating different ZPD. For example, learners 3, 4, and 7 have similar actual scores (14) but with mediation, learners 3 and 7 scored 21 and 23, showing a high LPS of 1 and

1.14, and learner 4 scored 20, demonstrating a medium-range LPS of 0.93. It shows that each individual learner needs a specific degree of mediation and help in order to develop his potential reading skills.

Table 8.

The Scores and LPS of Learners in CT-DA group

Learners	Actual performance	Mediated performance	LPS
1	21	28	1.25
2	15	22	1.04
3	14	21	1.00
4	14	20	.93
5	5	20	1.25
6	10	23	1.29
7	14	23	1.14

The findings of this section revealed that CT-DA procedure does not have any effect on Iranian EFL learners' learning potential score.

In order to further explore the differences between DA and CT-DA groups in terms of LPS scores, an independent sample t-test was run.

Table 9.

Independent Sample T-tests of LPS

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
LPS Equal variances assumed	3.775	.076	2.935	12	.012	.18388	.06265
Equal variances not assumed			2.935	9.985	.015	.18388	.06265

Table 9 revealed that there were significant differences between the learning potential of students who received DA treatment compared to those who received CT-DA treatment. It can be noted that although there were no significant differences between the two groups in their mediated performances, there were significant differences in their potential scores.

The third research question of the study explored the pattern of mediation that emerged in mediator-learner interaction and found the patterns that best nurture the development of L2 reading comprehension of learners. As mentioned in the method section, this study adopted an interactionist approach to DA. As Poehner (2005) argues, Brown's interventionist model is different from Feuerstein's interactionist model regarding the fact that in the former, mediation is presented from the most implicit one to the most explicit one and tests are run in a roughly standardized method. While in the latter, Feuerstein completely incorporates assessment and instruction in a way that no one of them exists without the other one. Therefore, the mediation offered to learners in CT-DA group was not pre-specified and arose from mediator and learners' dialogue. (interactionist approach). Following the objective of the study, an effort was made to find the pattern of teacher mediation in a CT-DA approach to L2 reading comprehension. Thematic analysis was employed to code all instances of mediation which led to the development of L2 reading comprehension. Thus, a mediational pattern was obtained (see Table 10).

Table 10.

Mediation Typology for CT-DA group

1.	Accepting response
2.	Rejecting response
3.	Rereading the question and the relevant part
4.	Motivating the learner to provide evidence and counter-evidence

- | | |
|-----|--|
| 5. | Asking the words |
| 6. | Providing metalinguistic clues |
| 7. | Asking the learner to deeply analyze the arguments/evidences |
| 8. | Offering a choice |
| 9. | Translation |
| 10. | Encouraging logical conclusion |
| 11. | Providing the correct response and explanation |

Eleven mediational strategies were detected for the CT-DA group. In line with Aljaafreh and Lantolf (1994), Poehner (2005), and Ableeva (2010), the strategies are arranged from the most implicit to the most explicit. The mediator applies hints/prompts in order to motivate learners to participate and reconsider their performances and to assist them to move during their ZPD. One example of the strategies (i.e., 4) is provided here for *motivating the learner to provide evidence and counter-evidence*. This strategy typically arose as the second mediating step in situations when a thorough understanding of the central ideas appeared to be troublesome for the learner. As a result, the mediator attempted to raise the learner's awareness by encouraging him to provide reason and proof for his response. The excerpt below was extracted from CT-DA class.

Excerpt 5.

1. M: So....what was the problem ...with the advertisements?
2. L4: They may....may end illnesses
3. M: Do you know why?
4. L4: ---- (she thinks) illnesses disease
5. M: Yes, but how?
6. L4: look at here (pointed to his book) People become sick.
7. M: Emmm ...

8. L4: because ... because of food ... *that have high levels of fat and sugar* (read part of the text)
9. M: Exactly.
10. L4: and ... and this means heart problems
11. M: Exactly.

The learner was able to perceive the significant segments and produce an acceptable response; the mediator motivated him to provide a reason for his response in order to check his understanding of the text.

The following excerpt exemplifies another strategy: *accepting response*. This strategy was used by the mediator to clear the doubts of a learner when he was uncertain about the correctness or appropriateness of her response.

1. M: what did the man like?
2. L1: he liked basketball...em...and he is member of the college's group.
3. M: yes, but he wants to do something?
4. L1: he wants to leave it.
5. M: Very good, why?
6. L1: he fell behind his studies and ... the exams were were close.
7. M: yes, that's it.

Offering a choice was another strategy applied through CT-DA classes. The mediator used this strategy to differentiate whether learners have some understanding of the structure in question or not.

Excerpt 18

1. M: what is your answer?
2. L1: the girl studied a lot... and... she wants to go to a new place

3. M: Yes... Nigeria's Ballei mountains.
4. L1: yeah... that was the name... and she collects maps
5. M: Aha... and why does she collect map?
6. L1: to write a rout book to go there.
7. M: Wait, wait to write a what??
8. L1: A rout book... ketabe rah [he speaks in his L1]
9. M: rout book or route book?
10. L1: route book chon badesh mige mikhad raho neshunesh bede [he speaks in his L1].
11. M: well done.

In line 9, the mediator offers the learner a choice so that she could draw his attention to the distinction between the two words.

Discussion

This study tended to combine critical thinking and dynamic assessment procedures and explore their incorporated impacts on learners' reading comprehension skills. Essentially, the study aimed to probe whether and how critical thinking-oriented mediation through dynamic assessment procedure can affect participants' reading comprehension.

The first and second research questions of the study explored the impact of DA and CT-DA on learners' LPS scores. The findings demonstrated that:

- DA and CT-DA significantly improve learners' reading potential scores.
- Significant differences between LPS scores of DA and CT-DA groups were found, denoting the better performance of participants who received a critical thinking-oriented dynamic assessment.

According to Kozulin and Garb (2002), the ZPD level of learners who have high LPS is close to their ZAD, denoting that "the targeted ability is on the verge of internalization or self-regulation" (Ahmadi & Barabadi, 2014, p. 176). On the other hand, the ZPD level of learners who have low LPS is not close to their ZAD, denoting that the learners need much more mediation to internalize the given point. In line with Kozulin and Garb (2002), this study revealed that learners with low LPS used much more mediation in form of hints than the learners with high LPS. This information concerning learners' learning potential score can be used to create opportunities to develop their performance ability. For instance, learners who scored an average NDA but a low-level LPS should do some exercises which would help them learn better in future activities. While those who scored an average NDA but earned high LPS should do more challenging exercises. And for the learners who scored poorly both in NDA and LPS, some extra activities might be designed.

To answer the third research question which sought to examine the nature of interactions in CT-DA, the typical moves and strategies by the mediator were extracted. The findings demonstrated that:

- Eleven mediational strategies, arranged from the most implicit to the most explicit were recognized that enhanced the development of reading comprehension ability of learners.

The mediational strategies were organized in accordance with Aljaafreh and Lantolf's (1994) recommendation of implicit to explicit arrangement. The pattern of mediation obtained in this study is compatible to Poehner (2005) and Ableeva's (2010) typology of mediator's strategies; however, a number of discrepancies are seen between them.

Similar to previous mediation typology, the current study developed the mediation typology based on the mediator's collaboration with learners per

session. The mediation was not predetermined in order to bring about a flexible interaction with learners.

In accordance with Aljaafreh and Lantolf's Regulatory Scale, "a general principle is discernable for organizing the kinds of mediation used, namely movement from the abstract/symbolic to the concrete" (Poehner, 2005, p. 159). However, dissimilar to previous typologies, the researcher provided hints with respect to Davies and Barnett's (2015) framework of critical thinking teaching, which is a comprehensive model of critical thinking for the intention of enhancing learners' capability of critical thinking.

The result of this study run in accordance with previous studies regarding the positive effects of dynamic assessment procedures on academic performance (Hashamdar & Samadi, 2018; Izadi et al., 2017, 2018; Fani & Rastchi, 2015; Mardani, 2013; Heidari & Izadi, 2020; Poehner, 2005; El Soufi & See, 2019; Barjesteh & Vaseghi, 2012; Mozafari & Barjesteh, 2016; Heidari, 2020; Wale & Bishaw, 2020). In line with the literature, dynamic assessment far exceeded the standard assessment in terms of stronger diagnostic capacities and the deeper feedbacks it recommended for succeeding teaching (Yang & Qian, 2017). According to Shabani (2012, 2014), dynamic assessment procedures significantly demonstrated learners' independent (ZAD) and assisted (ZPD) cognitive functioning. Moreover, Mardani and Tavakoli (2011) revealed that DA is more than just a formative assessment as the technique helps to unveil participants' learning strategies and latent skills, resulting in revealing their potential performances.

Generally, it can be argued that the treatment, either in dynamic assessment format or critical thinking-oriented, would assist learners in internalizing the mediation and applying this knowledge when encountering difficulties in learning, in this case, reading.

Conclusion and Implications

The positive effect of DA observed on the EFL reading achievement of the participants shows the transcendence of dynamic assessment over traditional forms of assessment. As it was discussed before, traditional forms of assessment only measure already existent abilities (ZAD), whereas dynamic ones provide intentional and reciprocal support to the learner when s/he faces difficulties during the assessment procedure and assess the ability of the learner to learn from the interaction and to internalize the development. DA, including a mediated learning phase, gives insight into learners' learning capacity (ZPD) and yields remedial feedbacks leading them to better function during the exams. This study could contribute to a deeper understanding of Vygotsky's ZPD and how to use this construct to guide interaction with learners. The critical thinking format of DA developed in this study had the ability to reveal individual's abilities and to support their continued development.

Moreover, the mediational strategies developed in this study not only resolved the learners' L2 reading comprehension problems but also led them to realize their efforts in overcoming the problems. The inventories of mediational strategies can also possibly be used as a reference in providing assistance during interaction within a learners ZPD.

The present study added a new dimension to the available empirical literature (Ableeva, 2010; Poehner et al., 2015; Hashamdar & Samadi, 2018; Heidari, 2020; Fani & Rastchi, 2015; Mardani, 2013; Poehner, 2005; Davies & Barnett, 2015; El Soufi & See, 2019; Leach et al., 2020; Wale & Bishaw, 2020) on the implication of DA to EFL/ESL language reading. The study revealed that the mediation provided during DA and CT-DA sessions benefitted all learners. Most learners showed significant growth as a result of

mediation. The instructional value of DA and CT-DA lies in the fact that its results can be used for individualizing learning and developing individual learning plans according to the learners' needs. CT-DA, with its focus on tailoring the difficulty of the test to the learners' abilities and adaptation of prompts to the examinees' needs, can be innovative. Furthermore, instructors can employ CT-DA in classroom settings and obtain a measurable track of learners' learning changes. This would be informative both for instructors and learners making them aware of learners' deficiencies. Instructors can benefit from learner profile and scores generated by CT-DA which provide them with a clear picture of their learners' language abilities and help them discover the sources of the problems their students are facing at any proficiency level.

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