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Research Paper

Enhancing EFL Learners' Reading Comprehension Skill through Critical Thinking-Oriented Dynamic Assessment

Mohsen Zare

*Department of English and Literature, Ayatollah Amoli Branch,
Islamic Azad University, Amol, Iran*

Hamed Barjesteh¹

*Department of English and Literature, Ayatollah Amoli Branch,
Islamic Azad University, Amol, Iran*

Reza Biria

*Department of Foreign Languages, Khorasgan Branch, Islamic Azad
University, Isfahan, Iran*

Abstract

This study aimed to explore the possible effect of critical thinking-oriented dynamic assessment (CT-DA) on learners' reading comprehension performances. 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 (n=7), dynamic assessment (DA) (n=7) and Control group (n=7). While learners in CT-DA received mediation loaded with critical thinking, learners in DA received dynamic assessment mediation, and learners in the control group did not receive any mediation. A paired sample t-test, effect size and ANOVA were run. The results of analyses revealed that CT-DA and DA groups outperformed the control group. The results signified the efficacy of the type of mediation, which was presented through dynamic assessment procedure on enhancing the learners' reading achievement. Moreover, comparing the results of critical thinking-oriented dynamic assessment and

¹ Corresponding author: ha_bar77@yahoo.com

dynamic assessment revealed no statistical difference ($p > .05$), which indicates that both types of mediations (i.e., CT-DA and DA) had a similar impact on the learners' reading achievement. The article concludes with suggestions for further research on dynamic assessment and critical thinking in second/foreign language development.

Keywords: Critical thinking, Dynamic assessment, Mediation, Reading, ZPD

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1. Introduction

It has been vastly echoed by practitioners and scholars (Aloqaili, 2012; Dörnyei, 2019, Ellis, 2019) that the ultimate purpose of research is to decrease students' mistakes as well as upgrade practices by discovering more efficient ways of learning and finding more practical ways of instruction. Many researchers (e.g., Dörnyei, 2019, Lai, 2011; May, 2010; Park, 2005) 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 the 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 (Lai, 2011; May, 2010).

The present variations in reading theory are rooted 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 Brown, 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 those 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 critical thinking oriented dynamic assessment procedure, can impact upon participants' reading performance.

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 performance. In doing so, this study explores the effect of integrating critical thinking concept by Dynamic Assessment to foreign language reading instruction. As an improvement over traditional testing procedures, DA gives a more inclusive approach to the evaluation of learners' underlying abilities (Lantolf, 2009; Izadi, Khoshshima, Nourmohammadi, Yarahmadzahi, 2017, 2018). This leads to the enrichment of assessment practice in EFL/ESL contexts as it can provide 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.

According to the objectives of the study, the present research aims to explore the effect of dynamic assessment procedures on learners' reading

comprehension skills. Therefore, the study will follow the objectives formulating the following research questions:

- 1) Does dynamic assessment procedure (DA) have any significant effect on Iranian male EFL learners' reading comprehension?
- 2) Does critical thinking-oriented dynamic assessment (CT-DA) have any significant effect on Iranian male EFL learners' reading comprehension?
- 3) Is there any significant difference between reading comprehension of the three groups (CT-DA, DA and Control)?

Along with the research questions, the study aims to check the credibility of the questions. In doing so, the following null hypotheses are formulated for questions 1,2, and 3.

- 1) Dynamic assessment procedure (DA) does not have any significant effect on Iranian male EFL learners' reading comprehension.
- 2) Critical thinking-oriented dynamic assessment (CT-DA) does not have any significant effect on their Iranian male EFL learners' reading comprehension.
- 3) There is not any significant difference between reading comprehension of the three groups (CT-DA, DA and Control).

2. Literature Review

2.1 Dynamic Assessment

Dynamic Assessment (DA) "is 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).

Studies on DA have been proliferated since its introduction (Sarani & Izadi, 2018; Heidari, 2020); while all previous studies have explored an

interactionist approach to DA, none, to our knowledge, puts explicit emphasis on the learner's critical thinking state.

2.2 Critical Thinking

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 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.

The inspiration for combining critical thinking and reading comprehension was overshadowed by previous results concerning the impact of critical thinking on reading attainment. In the literature on EFL/ESL reading, studies have 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; Soodman Afshar & Rahimi, 2014; Mashhadi, 2013), 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, 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 the 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 reading comprehension skills of learners through dynamic assessment is founded on the need to focus on process rather than product (Brown, 1981). In the EFL/ESL literature, a number of studies (Fani & Rastchi, 2015; Mardani, 2013; Abdolrezapour, 2017; Mardani & Tavakoli, 2011) found a contributing effect for DA on students' reading achievement.

2.3 Empirical Studies

With respect to the literature on dynamic assessment, reading comprehension and critical thinking, a number of studies have been carried out. 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 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 (2017) suggested that instructional benefits of EDA found in her study could be helpful for individualizing learning and developing individual learning plans in accordance with learners' 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. 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, namely pre-test, immediate post-test, and delayed post-test. The results of the study revealed that there was not any noteworthy difference in the immediate and delayed effect of DA on students' reading performance regarding language proficiency, namely low-, mid-, and high. It 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 does not affect the amount of taking the 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 on 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 dynamic assessment in terms of reading performance. 124 undergraduate female students participated in the study. Campione and Brown's Graduated Prompt Moves Protocol (GPMP) was used to mediate learners. According to the results, mediation in Concurrent and Cumulative Group DA and Individualized DA had 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 between 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 the studies by Kamali and Fahim (2011), Yousefi and Mohammadi (2016), Heidari (2020), and Zare and Biria (2018). 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 critical thinking concept, affects male EFL/ESL learners' reading performance. To put it simply, 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 the 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 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 use to take risks, promote efficacy, and enhance critically and intellectually.

3. Methodology

3.1 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, 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, 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 selected. The learners were 19-22 years old. Learners' mother tongue was Persian/Farsi and English was their second language, which they had been learning as a foreign language for one year at university.

3.2 Instruments

To carry out the intended research the following instruments were used. These materials were divided into two parts. Part one included instructional materials consisting of the textbook (ACTIVE Skills for Reading 1), and the mediational activities. Part two included assessment materials consisting of Oxford Quick Placement Test, First Certificate English, critical thinking questionnaire, and two reading tests that were considered as pre- and post-tests.

3.2.1 Mediational activities

During the eight-session treatment of experimental group, participants of the CT-DA group were given mediational feedback. This mediation feedback was posed by 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 on 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

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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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> a) Having a clear definition of the matter at hand. b) Distinguishing the very purpose of the issue. c) Making adaptations between the purpose and evidence as well as values. d) Making value-laden inferences on the basis of previous findings. e) Not claiming a definite inference: Have an evolving and iterative rethinking over the issue in order not to propose a fixed deduction. |
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3.2.2 Critical Thinking Questionnaire

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 to be 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.

3.2.3 Reading Comprehension Test

To measure the students' reading comprehension performance before and after the treatment, the study adopted the reading comprehension test provided by ACTIVE Skills for Reading series. The pre-test consists of four passages including 28 multiple choice questions and the post-test, similar to 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 as the sample of this study. The Cronbach α was reported to be .95 and .91 for each test, respectively.

3.3 Procedure

This study used a quasi-experimental, quantitative method to provide a better picture and understanding of the results. 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 homogeneity of the learners, they were randomly divided into three groups namely 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 an eight-week treatment. The treatment included two sessions per week (two hours for each session) and one lesson was covered per session (totally 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 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 on as follows: 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 the instructor and learners engaged in an open-ended, one-on-one dialogue during a 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 and motivated 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 (Figure 1 and 2). The students in DA groups received the same mediation except 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., pre-test) and after (post-test) the treatment. Learners were asked to read the texts and answer the items. After administering the tests, the data were collected for quantitative analysis to answer questions of the study.

3.4 Data Analysis

To answer the research questions of the study, descriptive and inferential statistics were applied. With respect to the first and second research questions, mean and standard deviation and a paired sample t-test were run to check whether exposing learners to pure dynamic assessment procedure and critical thinking-oriented dynamic assessment procedure had any significant effect on learners' reading comprehension. Moreover, effect sizes were calculated to check the effect of any possible significant differences. The results were used to confirm or reject the first and second research hypothesis of the study.

In order to answer the third research question of the study and to find out the differences between the three groups (CT-DA, DA and control), mean and standard deviation, ANOVA and Post Hoc test were applied to check the differences between the three groups and to indicate the significance of differences. The results were used to confirm or reject the third research hypothesis of the study.

4. Results

Research Question One

The first question of the study aimed to explore the possible impact of dynamic assessment procedure on Iranian male EFL learners' reading comprehension performance. To answer this question, Table 3 demonstrates the descriptive statistics of learners' unmediated and mediated performances. The learners' performances before and after the mediation pinpoint interesting findings with respect to reading comprehension development through cooperative interaction with the mediator. Comparisons of the means reveal that the learners had better performances after the mediation (see Table 3). For example, the mean scores of the learners after mediation ($M=20.14$, $SD=2.41$) reveal a marked improvement in learners' reading comprehension as compared to their actual performance before mediation ($M=13.85$, $SD=3.07$).

Table 3

Descriptive statistics of actual and mediated scores

	N	Minimum	Maximum	Mean	Std. Deviation
Actual	7	10.00	20.00	13.8571	3.07834
Mediated	7	18.00	25.00	20.1429	2.41030
Valid N (listwise)	7				

According to Table 4, the paired-samples t-test results showed that this difference between actual and mediated performances of learners was significant ($t(6)=-12.05$, $p<0.01$) and Cohen's effect size value ($d=2.27$) showed a high practical significance. This indicates the positive impact of mediation on the development of learners' reading comprehension and is an evidence of learners' internalization of mediation.

Table 4

Paired sample t-tests of actual and mediated scores

Pair	DA - DA2	Paired Differences					t	df	Sig. (2- tailed)
		Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference				
1		-6.2857	1.380	.52164	-7.5621	-5.009	-12.05	6	.000

Based on the results, the null hypothesis related to the first research question of the study thus was rejected. Therefore, it can be concluded that dynamic assessment procedure does have a significant effect on Iranian male EFL learners' reading comprehension.

Research Question Two

The second research question aimed to investigate whether critical thinking oriented dynamic assessment procedure has any significant effect on Iranian male EFL learners' reading comprehension. To answer this question, Table 5 demonstrates the descriptive statistics of learners' unmediated and mediated performances. Comparisons of the means reveal that the learners had better performances after the mediation (see Table 5). For example, the mean scores of the learners after mediation ($M=22.42$, $SD=2.76$) reveals a marked improvement in learners' reading comprehension as compared to their actual performance before mediation ($M=13.28$, $SD=4.88$).

Table 5

Descriptive statistics of actual and mediated scores

	N	Minimum	Maximum	Mean	Std. Deviation
Actual	7	5.00	21.00	13.2857	4.88925
Mediated	7	20.00	28.00	22.4286	2.76026
Valid N (listwise)	7				

The results of paired-samples t-test also revealed that this difference between actual and mediated performances of learners was significant ($t(6)=-$

6.94, $p < 0.01$) and Cohen's effect size value ($d = 2.30$) revealed a high practical significance. This indicates the positive impact of mediation on the improvement of learners' reading comprehension and is an evidence of learners' internalization of mediation.

Table 6

Paired sample t-tests of actual and mediated scores

Pair		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
					Lower	Upper			
1	CTDA - CTDA2	-9.142	3.48	1.3170	-12.365	-5.92	-6.94	6	.000

Based on the results, the second null hypothesis related to the second research question of the study was thus rejected. Therefore, it can be concluded that critical thinking-oriented dynamic assessment (CT-DA) does have a significant effect on Iranian male EFL learners' reading comprehension.

Research Question Three

The third research question explored whether there was any significant difference between reading comprehension of the three groups (CT-DA, DA and control). To check the differences, ANOVA test was run and the results were tabulated in Table 7. The results of ANOVA further revealed that treatment (CTDA, DA, C) was significant ($F(2)=8.65$, $p < 0.01$). This could be due to the mediation presented to the learners. This implied that mediation (either in the form of CTDA or DA) helped the learners in a maximally effective way. Concerning the learners' actual and mediated performances, Poehner, et al. (2015) observed that

DA is not to improve student test scores but to attempt a diagnosis of actual and potential, or proximal, development. While the actual score indicates learner

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independent performance, it tells us nothing about how much mediation a learner needed as he or she worked through items targeting specific language constructs. Following Vygotsky's position that for diagnosis to be maximally informative for subsequent instruction it must take account of the ZPD, the mediated score signals learner responsiveness to mediation during the test (p. 11).

Table 7
ANOVA test of different treatments

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	141.714	2	70.857	8.651	.002
Within Groups	147.429	18	8.190		
Total	289.143	20			

The results of Post Hoc tests also showed that there is significant difference between CT-DA ($p=0.002$) and DA ($p=0.04$) and control group. However, no significant differences were found between CT-DA and DA treatment ($p=0.31$). According to the results, part of the null hypothesis was accepted and it was concluded that there was a significant difference between reading comprehension of CT-DA and DA, on the one hand, and control, on the other.

Table 8
Post Hoc Tests

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
1.00	2.00	2.28571	1.52975	.317
	3.00	6.28571*	1.52975	.002
2.00	1.00	-2.28571	1.52975	.317
	3.00	4.00000*	1.52975	.044
3.00	1.00	-6.28571*	1.52975	.002
	2.00	-4.00000*	1.52975	.044

5. 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 the critical thinking-oriented mediation through dynamic assessment procedure can affect participants' reading comprehension. The results related to the first research question of the study revealed that DA resulted in the development of the reading comprehension ability of learners. Regarding the second research question of the study, the findings revealed that critical thinking-oriented dynamic assessment resulted in the development of the reading comprehension ability of learners. Finally, the last question of the study indicated that the participants who received mediation in form of critical thinking-oriented dynamic assessment and pure dynamic assessment outperformed the participants who received no treatment. It means that the mediation helped improve the learners' reading progress. Moreover, the results of the study showed that the differences between CT-DA and DA groups, on the one hand, and the control group, on the other, are significant. However, no significant differences were found between CT-DA and DA groups, revealing that the mediation in either form of CT-DA or DA significantly developed the learners' reading comprehension.

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; 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 traditional static assessment for its stronger diagnostic capacities and the deeper insights it provided for subsequent teaching (Yang & Qian, 2017).

According to Shabani (2012, 2014), dynamic assessment procedures significantly demonstrated learners' independent (ZAD) and assisted (ZPD) cognitive functioning. Moreover, Izadi et al., (2017, 2018) 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.

With respect to the second research question, no similar studies which apply dynamic assessment with a focus on critical thinking skills have been conducted. However, 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 suggested that incorporation of DA as a supplement procedure to standardized testing has positive effects on both the test performance and learning of the students. Moreover, Abdolrezapour (2017), who explored the possible impact of dynamic assessment procedure with a focus on emotional intelligence, suggested that instructional benefits of emotional intelligence-DA found in her study could be helpful for individualizing learning and developing individual learning plans in accordance with learner's needs. Similarly, Shabani (2014) argued that results from dynamic assessment sessions provided evidence in support of learners' growing agency and independent functioning in innovative contexts. It can be discussed that incorporating critical thinking skills while providing hints to the learners not only can promote the active engagement of students in constructing their own knowledge and understanding (Mozafari & Barjesteh, 2016, Heidari, 2020; Wale & Bishaw, 2020) but also enable teachers to assess the gains they are making in teaching higher order thinking.

This 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 for 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. With its focus on tailoring the difficulty of the test to the learners' abilities and adaptation of prompts to the examinees' needs, CT-DA 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.

There were some limitations that need to be acknowledged and addressed with respect to the study. The first limitation is related to the sample size of the study. Had the study been implemented on a larger sample, the quantitative results obtained in this study could have been more reliable and generalizable to other contexts. Moreover, only male participants were considered in the study. Therefore, it is suggested that future studies incorporate a larger sample focusing on both female and male subjects. Furthermore, it is suggested that future studies track the development of reading comprehension over longer periods of CT-DA and have more rigorous analyses of mediator-learner interaction in order to offer more insights into mediator-learner interaction and refine our understanding of L2 reading comprehension processes.

6. Conclusion

Generally, it can be argued that the treatment, either in dynamic assessment format or critical thinking-oriented, would assist learners to internalize the mediation and apply this knowledge when encountering difficulties in learning, in this case reading. The positive effect of DA observed on the EFL reading achievement of the participants shows the advantage of dynamic assessment over traditional forms of assessment. As it was discussed before, traditional forms of assessment only measure already existent abilities whereas dynamic ones provide intentional and reciprocal support to the learner when s/he faces difficulties during 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 helping them to function better 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.

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