The Measurement and Incorporation of ZPD Scenarios in Developing Writing Complexity in EFL Classes: Group-Wide ZPD vs. Individualized ZPD

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Abstract: Despite growing interest in the studies on Zone of Proximal Development (ZPD), its operation in the forms of individualized and group-wide has been controversial. To cast some empirical light on the issue, this study was designed to quantitatively and comparatively study the applicability of the two scenarios of ZPD-based instructions to the writing complexity of Iranian EFL learners in terms of learners' types (low vs. high scorers). To this end, 118 EFL learners identified as homogeneous based on the TOEFL ITP test were randomly assigned into two equal experimental groups (individualized ZPD- and group-wide ZPD-based groups) which respectively received compatible instructions utilizing conference writing (as an individual scaffolding technique) and low- and high-structured writing templates (as a whole-class scaffolding technique). The treatments were allocated to the groups in a random manner within homogeneous blocks. Prior to and after the treatments, three tests (two writing tests and one ZPD test) were administered to measure both groups' writing complexity and their ZPD levels. A ZPD test was also administered in the mid of treatments. The non-parametric analysis of covariance (ANCOVA) revealed that the individualized-ZPD-based instruction is constructive to the writing complexity of the low scorers, while the group-wide ZPD-based instruction shows not much constructive to the writing complexity of the high scorers. The findings pointed to the use of ZPD-based instructions in TEFL writing in meaningful contexts and thereby showing impacts made on the writing complexity of learners. The study, indeed, yields support to the feasibility of group-wide ZPD measurement along with an individualized ZPD approach.

Keywords: Scaffolding, Individualized-ZPD-Based Instruction, Group-Wide-ZPD-Based Instruction, Writing Complexity, Sociocultural Theory.

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Introduction

Vygotsky's Socio-Cultural Theory (SCT) (1978) is regarded as a major breakthrough in the field of social psychology and as a resultant in education in general and language education in particular given the significant role of the sign system in social construction. SCT is based on certain macro principles mainly including developmental analysis of the mental program, the social basis of human cognition, scaffolding, mediated learning, and ZPD. As far as the teaching and learning processes are concerned, the three last principles in general and the notion of scaffolding in particular, as the most practical core of the educational side of SCT, have gained momentum in research as they are tightly interwoven with developing a trait.

In Vygotsky's sense, scaffolding is defined as the "role of teachers and others in supporting the learner's development and providing support structures to get to that next stage or level" (Raymond, 2000, p.176, as cited in Van Der and Rachel, 2002). It is, in fact, a subservient to ZPD while ZPD exploration is a pre-requisite to scaffolding; lending support to their 'interwoven nature'. Nassaji and Swain (2010), indeed, highlighted that negotiated help provided within the learners' ZPD is more effective than help provided randomly.

Wood, Bruner, and Ross (1976) argued that scaffolding is the way an expert helps novice progress through a process of interaction and this interaction can be in the form of feedback. Shepard (2005) described feedback as a scaffolding strategy provided to the learners. Based on a simplified model of Aljaafreh and Lantolf (1994) adjusted by Baleghizadeh, Timcheh Memar, and Timcheh Memar (2011), there are six levels of feedback from implicit to explicit level. Widdowson (1990), indeed, asserted that scaffolding learning is one of the best researched of all teaching strategies.

On language and education, some studies have suggested that simply correcting errors in second language learners' writing has no effect on the development of their writing skills; however, when this error correction is coupled with feedback and somehow scaffolding provided by an expert, students come to a better understanding of the error and are able to correct it in subsequent writings (Byrd, 2008; Kepner, 1991; Ferris, 1999; Truscott, 1996, 1999). Based on the results of these studies, it is very likely that an excellent way to implement feedback in the classroom is through collaborative debriefing sessions. In the same vein, Lockhart (1995), Mangelsdorf and Schlumberger (1992), as well as McGroarty and Zhu (1997) held that collaborative work facilitates writing development more than lecture-based, prescriptive pedagogies. Furthermore, when students are assessed not only on their own writing, but also on

the quality of feedback, scaffolding, and interaction they receive or provide to their peers, a state of commitment and interest is fostered which creates a richer learning environment (De Guerrero & Villamil, 1994).

While SCT principles have been implemented as to certain skills of language ability, writing skill seems to have been left intact to some extent. Writing is one of the main and productive skills as well as a significant requirement for EFL learners (Richards and Renandya, 2010). While most people have no difficulty in being proficient in other language skills in their native languages, becoming a skilled writer even in the mother tongue is quite challenging; let alone becoming a competent writer in a second or foreign language (Gregersen, 2003). At the same time, writing is often considered the most difficult skill to be mastered because of its complexity (Hapsari, 201١). Writing is a progressive skill, and students need the opportunity to practice writing, receive feedback, and rewrite to develop and improve their skills and understanding of the material (Blankenship & Wilson, 2009).

Nowadays, researchers (Ellis, 2003) are in agreement that L2 proficiency, in general, and writing proficiency, in particular, are multi-componential in nature, and that their principal dimensions can be adequately and comprehensively captured by the notions of complexity, accuracy, and fluency (CAF; Housen, 2009). And, complexity is usually viewed as being the most controversial of the three proficiency measures. Skehan and Foster (1997) defined writing complexity as, "learners' capacity to use more elaborate and complex target-like language" (p. 230). According to Skehan (1996), complexity is "the stage and elaboration of the underlying inter language system" (p. 46), which utilizes complicated and structured inter-language (Skehan, 1998). Ellis and Barkhuizen (2005) defined complexity "as the extent to which learners produce elaborated language" (p.139). Wolfe- Quintero et al. (1998, as cited in Polio, 2001) defined complexity as "a wide variety of both basic and sophisticated structures and words, available to the learner" (p.69). Finally, Ellis (2008) and Skehan (2009) respectively defined complexity as "the capacity to use more advanced language" and "the challenging language".

As far as language education in Iran is concerned, several studies have been conducted on the application of SCT. Investigating the efficiency of two types of group-dynamic assessments-DA- (i.e. concurrent and cumulative) in teaching English article by Miri, Alibakhshi, Kushki, and Bavarsad (2017), the impact of peer-mediated and individual writing conditions on intermediate female EFL learners' writing fluency, complexity, and accuracy by Azari and Pouyan (2016) and a similar study by Jalili and Shahrokhi (2017), as well as the effectiveness of the use of DA compared to traditional assessment in final evaluation of the process and product of learners by

Aghaebrahimian, Rahimirad, Ahmadi, and Alamdari (2014), and also the effects of the low-structured vs. high-structured scaffoldings on the reading by Baleghizadeh et al. (2011), as well as the impacts of whole-class and individual scaffoldings on all four aspects of writing (i.e. lexical complexity, fluency, grammatical accuracy, and cohesion) disregarding the learners types in terms of their proficiency level (low and high scorers) and their ZPD levels and the rate of its development during the treatment by Mirzapour, Ahangari, Saeidi (2015).

As it has been discussed in previous paragraphs, scaffolding associates peer-and cooperative endeavor on one hand and its implementation seem unimaginable in the absence of ZPD measurement and operationalization. Analogous to society, the classroom setting is the combination of individuals working and cooperating in a community. It is a must and, of course, to some extent more feasible to identify and probably measure one's ZPD in a bid to offer some kind of compatible education and input. Nevertheless, pure individualization may look odd with the other principles of SCT, which is strongly in favor of socially-mediated learning and defining learning as movement along the continuum of intra-personal and interpersonal processes. Such a social, cooperative, and collaborative nature of learning and development requires an initiative to measure both individualized ZPD along with group-wide ZPD such that the expected mediation, scaffolding, and inter-personal and intra-personal processes can be compatible and cooperative.

Then, the main problem to be addressed is twofold: operationalization of the varieties of ZPD-based instruction (i.e. individualized vs. group-wide), and incorporation of these two varieties in teaching language skills in relation to the learners' variables i.e. their proficiency level (low- and high-scorers). Based on the significance of the two categories of ZDP and writing in EFL contexts on one hand and the undesirable status of the writing performance of Iranian EFL learners (Hasani and Moghadam, 2012) on the other hand, this very study is rationalized on the following two premises:

- the interfaces between EFL learners' writing quality in terms of complexity and the two types of ZPD-based instructions (i.e. individualized and group-wide)

- Comparative study of these instructions' effect on enhancing writing quality (i.e. complexity) of Iranian EFL learners in terms of learners' types (i.e. low and high scorers).

In order to accomplish these objectives, the present study, focusing first and foremost on measuring each target learner's individual ZPD and then their group-wide or average ZPD, and second on the feasibility and application of each ZPD scenarios in developing the writing ability of Iranian EFL learners. More specifically the following primary question addressed through four secondary ones were posed and attempted to this end:

1.   Is there any significant difference in the effect of Group-wide ZPD-based instruction and individualized ZPD-based instruction on the writing complexity of Iranian EFL learners in terms of learners' types (i.e. low vs. high scorers)?

1.1   Do group-wide ZPD-based instruction and individualized-ZPD-based instruction have a different impact on the complexity of EFL low scorers' writing?

1.2   Do group-wide ZPD-based instruction and individualized-ZPD-based instruction have a different impact on the complexity of EFL high scorers' writing?

1.3   Does group-wide ZPD-based instruction have a significantly different effect on low scorers compared to high scorers in developing their writing complexity?

Does individualized-ZPD-based instruction have a significantly different effect on low scorers compared to high scorers in developing their writing complexity?

Methodology

The Design and Method

The present research was designed to quantitatively and comparatively study the applicability of the two scenarios of ZPD-based instructions (as the independent variable) to the writing complexity (as the dependent variable) of Iranian EFL learners in terms of learners' types (low vs. high scorers). The research was conducted empirically through the implementation of the pretest-treatment-posttest design. And according to Dodge (2008) and Freund, Wilson, and Mohr (2010), whereas the participants were assigned to two blocks based on their scores (low and high scorers), and then each block was randomly assigned to treatments (either group-wide or individualized ZPD-based instructions), the research was conducted based on a randomized block design under the umbrella of experimental design. For this design, some of the low scorers got the group-wide ZPD-based instruction, and some of the low scorers got the individualized ZPD-based instruction; some of the high scorers got the group-wide ZPD-based instruction, and some of the high scorers got the individualized ZPD-based instruction. This design ensured that each treatment condition has a nearly equal proportion of low and high scorers. As a result, differences between treatment conditions cannot be attributed to scores. Hereby, this randomized block design removed score as a potential source of variability and as a potential confounding variable. Data from this randomized block design have been also analyzed by a nonparametric rank-based method known as the Friedman test (Freund et al., 2010).

Participants

In conducting this research, a total of 118 undergraduate, intermediate Persian EFL learners of both genders in the age range of 18 to 22 years old majored in Translation Studies from the Islamic Azad University of Shahr-e Qods in Tehran were selected based on convenient sampling. Table 1 displays the demographic data of the research participants. In a bid to compensate for the generalizability of the findings given the small sample size in each group, the treatments were run for a longer time during two consecutive academic semesters. Furthermore, two English instructors (the researcher and her colleague) participated in this study as the "raters" of the writing papers. The two types of ZPD-based instructions were run by the researcher herself (with more than 5 years of experience in teaching English writing and about 20 years of news editing), while the assessments were made by the researcher and her colleague with more than 20 years of experience in teaching English writing.

Table 1. *Demographic Data of Research Participants*

Characteristics	Value
Participants (n)	118
Mean age (years)	20
Gender [(male/ female)]	(60/58)
Low scorers (n)	65
- Group-wide (n)	48
- Individualized (n)	17
High scorers (n)	53
- Group-wide (n)	26
- Individualized (n)	27
Group-wide (n)	74
- Low scorers (n)	48
- High scorers (n)	26
Individualized (n)	44
- Low scorers (n)	17
- High scorers (n)	27
Duration of treatment	Two consecutive academic semesters

Instrumentation and Materials

TOEFL Test: A TOEFL ITP test consisting of three subsections of 1) listening comprehension, 2) structure and written expressions, and 3) vocabulary and reading comprehension were used for measuring the participants' language proficiency level (to ensure that all of them are homogenous in terms of being in the same level of English proficiency i.e. intermediate).

Writing Tests: To increase the validity of the measures and obtain a reliable estimate of students' writing achievement, two criterion-referenced writing tests were run in all groups somehow as both pretests and posttests evaluating writing abilities and achievements of the participants, respectively, prior to and after the treatment as follows:

A) TOEFL writing tasks (TWT, including reading passages and recorded lecture) and opinion essay tests. In addition to the writing section of the TOEFL, the following specific writing test has also been used.

B) A narrative text including 3 paragraphs about the participants' own life or family.

Correlation between this test (a narrative text) and the two first TOEFL writing tests (TWT and opinion essay) was gained as well in line with increasing the validity of the measures. Then, based on the mean scores of these three writing pretests, low scorers, and high scorers of all the participants involved in the two treatment groups (individualized and group-wide) were determined.

Raven's Standard Progressive Matrices (SPM): Raven's Standard Progressive Matrices (SPM; Raven, 1998) -- which is an IQ test for the general growth of learners upper than age 7 and as described by Kozulin and Grab (2002) as "a standard psychometric task" --, employed by several scholars such as Fernández Dobao (2012) as well as Birjandi and Daftarifard (2011), was utilized for the ZPD assessment of dynamic general cognitive abilities of the participants before, during and after the treatment.

Kozulin and Grab's Framework: Kozulin and Grab's (2002) formula of analyzing learners' performance in DA (ZPD-based instruction) through comparison of learning potential score (LPS) was employed to measure and compare the ZPD's growth of the participants during and after the treatments as follows:

$$LPS = \frac{(S_{post} - S_{pre})}{S_{max}} + \frac{S_{post}}{S_{max}} = \frac{2S_{post} - S_{pre}}{S_{max}}$$

Treatment Materials: To provide the two types of ZPD-sensitive instructions, two types of scaffolding techniques (i.e. individual and whole-class) were employed. The first treatment group received low- and high-structured writing templates (i.e. a whole-class scaffolding technique used in the group-wide ZPD-based instruction). However, the second treatment group received conference writing (i.e. an individual scaffolding technique utilized in the I-ZPD-based instruction).

Moreover, based on the guidelines of ACTFL 2012 and the content of the first seven chapters of "Academic Writing from Paragraph to Essay" by Rumisek and Zemach (2005), a temporary lesson plan for 12 sessions of treatment in writing 1 was planned and finalized in each session. The following session's implementation was based on the analysis of the LPSs and the feedback received from all of the participants (individually and whole-class through gaining the mean score) in each session.

Writing Competence and Indicators: Learners' quality of writing was investigated and measured by means of one out of four competencies suggested by Connor and Mbaye (2002) for writing difficulties, that is, grammatical competence (lexical complexity), which is equal to Wigglesworth and Storch (2009)'s writing indicators of complexity along with two other indicators of accuracy and fluency. The complexity of the writings was measured based on the criteria proposed by Fontanini et al. (2005), through the proportion of lexical words to function words.

Procedure

Sampling: Sampling a homogeneous group of 118 intermediate students based on their performance on their TOEFL ITP.

Taking Pre- and Post-tests: Administering three pre- and post-tests (two writing tests and a ZPD test) in the first and the last sessions, respectively. The two treatment groups were formed randomly to receive two types of ZPD-based instructions i.e. individualized and group-wide ZPD-based. In the first session, all the participants were asked to write an opinion essay on one of the given topics and a narrative text including 3 paragraphs about themselves or a family member as the two pre-tests of the study. They then were given appropriate feedbacks based on a simplified model of Aljaafreh and Lantolf (1994) adjusted by Baleghizadeh et al. (2011). In the first treatment group (group-wide), the class received feedbacks on the board and for the next session, the class was provided with a relevant template designed based on the class most common mistakes and the analysis of the class

LPSs' mean score helping the class avoid their most common mistakes made in the previous session as best as possible based on the growth rate of the class ZPD. While in the second treatment group (individualized group), each participant received feedbacks individually (i.e. face to face or via their portal) and his/her lesson plan for the next session was also designed based on his/her mistakes appeared on his/her own paper in each session and also the analysis of his/her LPS comparing the growth rate of each participant.

Taking a Mid-ZPD Test: Administering a ZPD-test in the sixth session of the treatment in order to study the ZPD development of the two treatment groups and give them their suitable ZPD-based instructions.

Comparing and Analyzing the Scores: Comparison was made between the pre- and post-tests' scores of the two intact writing classes. The learners' ZPD development -- measured prior, during, and after the treatment using Raven's Standard Progressive Matrices (SPM; Raven, 1998) taken from its original design (Penrose & Raven, 1936), retrieved from https://iqpro.org, and taking advantage of Kozulin and Grab's (2002) learning potential score's (LPS) formula for analyzing learners' performance in ZPD-based instructional system.

To estimate the inter-rater reliability between the two raters, a randomly selected cluster of writing papers, including 28 sets of papers, scored by the two raters. Running Pearson correlations between these score sets indicated that there were significant agreements between the scores of writing complexity (r (28) = .74, P < .05 representing a large effect size) as provided by the two raters. As a result, it was appropriate to employ the mean of the two scores provided by the two raters as the final score for each participant's writing performance (indicating complexity). To estimate the intra-rater reliability of the findings, the treatment was applied for two consequent semesters. Running Pearson correlations between the score sets taken from the first and second semesters' participants of the study indicated that there were significant agreements between the scores of their writing complexity (r (32) = .83, P < .05 representing a large effect size). As a result, it was appropriate to employ the mean of the two scores taken from the participants during the first and the second semesters as the final score for each participant's writing performance (indicating complexity) as well.

Results

Data Analysis

Due to the non-interval nature of the data, all research questions were probed through non-

parametric analysis of covariance (ANCOVA) and Friedman's test. Based on the analysis, and according to the t-test and P-value, the differences between the two groups were not significant (0.967 > 0.05). In other words, the two treatment groups were homogenous at the beginning of the study.

First Secondary Research Question: A nonparametric analysis of covariance (ANCOVA) was run to compare the low-scored g-wide ZPD-based instruction and I-ZPD-based instruction groups' performance on posttest of complexity while controlling for the effect of pretest in order to probe secondary RQ 1. Table 2 displays the descriptive statistics for the two groups on pretest and posttest of complexity, showing that the low-scored individualized group had higher means than the g-wide group on both pretest and posttest. The individualized group's means on pretest and posttest were .812 and .885, while the mean scores for the g-wide group were .714 and .715.

Table 2. *Descriptive Statistics, Pretest, and Posttest of Complexity by Groups (Low-Scored)*

| Groups		N	Minimum	Maximum	Mean	Std. Deviation
G-Wide	Pre-Complexity	48	.00	1.38	.7144	.26798
	Post-Complexity	48	.00	1.29	.7156	.37003
Individualized	Pre-Complexity	17	.54	1.38	.8129	.23481
	Post-Complexity	17	.48	1.50	.8853	.29494

As it is shown in figure 1:

- Low-scored individualized group had higher means (pre=.812 and post= .885) than the g-wide group (pre= .714 and post= .715) on both pretest and posttest.

- A significant increase was in the score of the low-scored individualized group from .812 in the pretest to .885 in the posttest (+0.073).

A very slight increase was in the score of the low-scored g-wide group from .714 in the pretest to .715 in the posttest (+0.001).

Figure 1 displays the two groups' means on pretest and posttest.
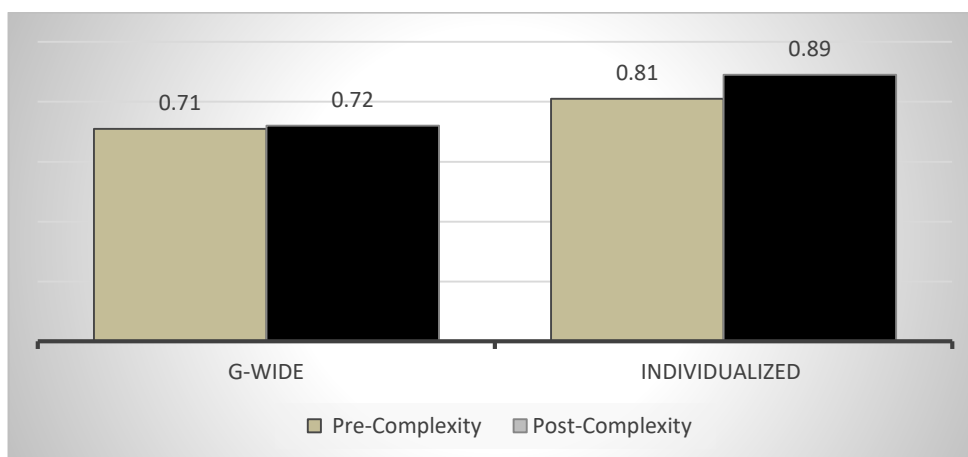
Figure 1. *Pretest and posttest of complexity by groups (low-scored)*

Table 3 displays the results of non-parametric ANCOVA (F (1, 63) = 1.47, P= .230) as well. Based on the data indicated in tables 2 and 3 and figure 1, there was a difference between the two groups' means i.e. low-scored individualized group vs. low-scored group-wide group comparing their pre and posttests. Accordingly, it can be said that the group-wide ZPD-based instruction and the individualized ZPD-based instruction have a "differently positive" impact on the complexity of EFL low-scorers' writing. Thus, the first secondary null-hypothesis was rejected.

Table 3. *Nonparametric Analysis of Covariance; Pretest and Posttest of Complexity by Groups (Low-Scored)*

F	DFH	DFE	P-Value
1.47	1	63	.230

Second Secondary Research Question: A nonparametric analysis of covariance (ANCOVA) was run to compare the high-scored g-wide ZPD-based instruction and I-ZPD-based instruction groups' performance on posttest of complexity while controlling for the effect of pretest in order to probe secondary RQ 2. Table 4 displays the descriptive statistics for the two groups on pretest and posttest, showing that while the high-scored g-wide group had a higher mean than the individualized group on pretest (GWpre= .995 vs. I-pre= .946), the high-scored individualized group had a higher mean than the g-wide group on posttest (I-pre= .934 vs. GW-post= .692).

Table 4. *Descriptive Statistics, Pretest, and Posttest of Complexity by Groups (High-Scored)*

Groups		N	Minimum	Maximum	Mean	Std. Deviation
G-Wide	Pre-Complexity	26	.50	1.30	.9954	.18535
	Post-Complexity	26	.00	1.33	.6927	.31306
Individualized	Pre-Complexity	27	.59	1.65	.9467	.26271
	Post-Complexity	27	.53	1.76	.9341	.38006

As it is shown in figure 2:

- The high-scored individualized group had lower means (pre=.946) than the g-wide group (pre= .995) on the pretest.

- The high-scored individualized group had higher means (post=.934) than the g-wide group (post= .692) on the posttest.

- A decrease of -0.303 was there in the score of the high-scored g-wide group from .995 in the pretest to .692 in the posttest.

- A slight decrease of -0.012 was there in the score of the high-scored individualized group from .946 in the pretest to .934 in the posttest.

Figure 2 displays the two groups' means on pretest and posttest.

Figure 2. *Pretest and posttest of complexity by groups (high-scored)*

Table 5 displays the results of non-parametric ANCOVA (F (1, 51) = 4.580, P = .037) as well. Based on the data indicated in tables 4 and 5 and figure 2, both high-scored groups (individualized and g-wide) got lower means on posttests compared to their pretests. Accordingly, it can be said that the group-wide ZPD-based instruction and the individualized ZPD-based instruction had a "differently negative" impact on the complexity of EFL high

scorers' writing. Thus, the second secondary null-hypothesis was rejected.

Table 5. *Nonparametric Analysis of Covariance, Pretest, and Posttest of Complexity by Groups (High-Scored)*

F	DFH	DFE	P-Value
4.58	1	51	.037

Third Secondary Research Question: A nonparametric analysis of covariance (ANCOVA) was run to compare the low- and high-scored g-wide ZPD-based instruction groups' performance on posttest of complexity while controlling for the effect of pretest in order to probe secondary RQ 3. Table 6 displays the descriptive statistics for the two groups on pretest and posttest, showing that while the low-scored g-wide group had a very slight increase of +0.001 in the posttest compared to the pretest ($M = .714$ vs. $M = .715$), the high-scored g-wide group had a decrease of -0.3٠٣ in the posttest compared to the pretest ($M = .995$ vs. $M = .692$).

**Table 6.** *Descriptive Statistics, Pretest, and Posttest of Complexity by Score Levels (G-Wide Group)*

Levels		N	Minimum	Maximum	Mean	Std. Deviation
Low	Pre-Complexity	48	.00	1.38	.7144	.26798
	Post-Complexity	48	.00	1.29	.7156	.37003
High	Pre-Complexity	26	.50	1.30	.9954	.18535
	Post-Complexity	26	.00	1.33	.6927	.31306

As it is shown in figure 3:

- The high-scored g-wide group had a higher mean (.995) than the low-scored g-wide group (.714) on the pretest.

- The high-scored g-wide group had a lower mean (.692) than the low-scored g-wide group (.715) on the posttest.

- A decrease of -.303 was there in the score of the high-scored g-wide group from .995 in the pretest to .692 in the posttest.

- A very slight increase of +.001 was there in the score of the low-scored g-wide group from .714 in the pretest to .715 in the posttest.

Figure 3 displays the two groups' means on pretest and posttest of complexity.
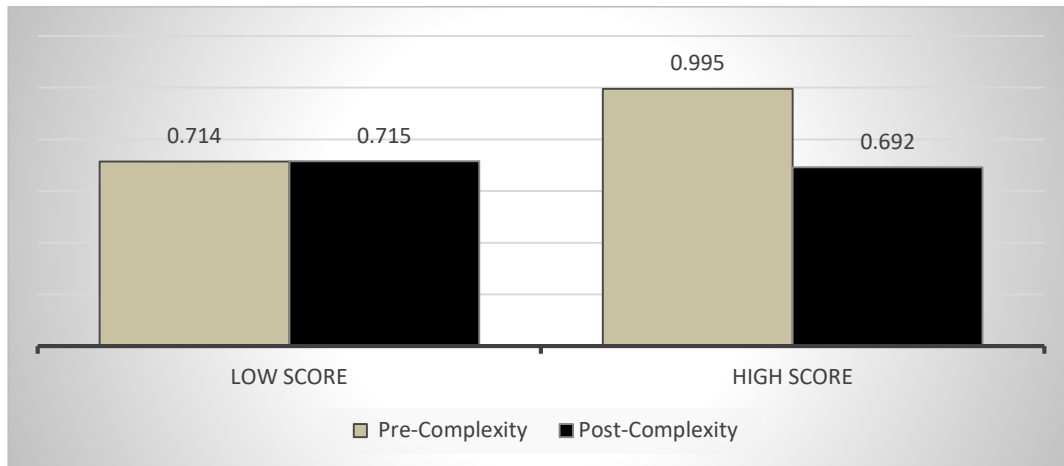
Figure 3. *Pretest and posttest of complexity by score levels (g-wide group)*

Table 7 displays the results of non-parametric ANCOVA (F (1, 72) = 1.23, P = .270) as well. Based on the data indicated in tables 6 and 7 and figure 3, the g-wide ZPD-based instruction had a significantly different impact on the writing complexity of EFL high-scored learners (negative) compared to low-scored learners (positive). Thus, the third secondary null-hypothesis was rejected.

Table 7. *Nonparametric Analysis of Covariance, Pretest, and Posttest of Complexity by Score Levels (G-Wide Group)*

F	DFH	DFE	P-Value
1.235	1	72	.270

Forth Secondary Research Question: Similarly, nonparametric analysis of covariance (ANCOVA) was used to compare the low- and high-scored I-ZPD-based instruction groups' performance on the posttest of complexity while controlling for the effect of pretest in order to probe secondary RQ 4. Table 8 displays the descriptive statistics for the two groups on the pretest and posttest, showing that the high-scored individualized group had higher means on both pretest (*M*-pre = .946 vs. .812) and posttest (*M*-post= .934 vs. .885) than the low-scored group.

Table 8. *Descriptive Statistics, Pretest, and Posttest of Complexity by Score Levels (I-Group)*

Levels		N	Minimum	Maximum	Mean	Std. Deviation
Low	Pre-Complexity	17	.54	1.38	.8129	.23481
	Post-Complexity	17	.48	1.50	.8853	.29494
High	Pre-Complexity	27	.59	1.65	.9467	.26271
	Post-Complexity	27	.53	1.76	.9341	.38006

As it is shown in Figure 4:

- The high-scored individualized group had a higher mean (.946) than the low-scored individualized group (.812) on the pretest.

- The high-scored individualized group had a higher mean (.934) than the low-scored individualized group (.885) on the posttest.

- A slight decrease of -. 012 was there in the score of the high-scored individualized group from .946 in the pretest to .934 in the posttest.

- A slight increase of +.073 was there in the score of the low-scored individualized group from .812 in the pretest to .885 in the posttest.

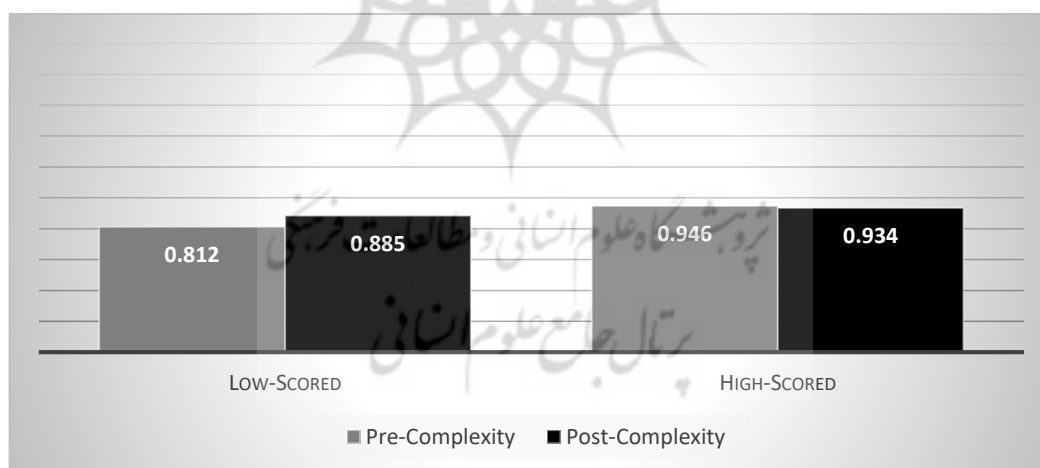Figure 4 displays the two groups' means on pretest and posttest.

Figure 4. *Pretest and posttest of complexity by score levels (I-Group)*

Table 9 displays the results of non-parametric ANCOVA ($F (1, 42) = .432, P = .514$) as well. Based on tables 8 and 9 and figure 4, there was a significant difference between the two group's means on the posttest compared to their pretests. I-ZPD-based instruction had a significantly different impact on the writing complexity of EFL high-scored learners

(negative) compared to low-scored learners (positive). Thus, the fourth secondary null-hypothesis was rejected.

Table 9. *Nonparametric Analysis of Covariance, Pretest, Posttest of Complexity by Score Levels (I-Group)*

F	DFH	DFE	P-Value
0.432	1	42	.514

Results

As to the first and the second secondary research questions about the impact of the two types of ZPD-based instructions on the writing complexity of Q1. The low-scored learners, and Q2. The high-scored learners, the researchers taking advantage of the criteria proposed by Fontanini et al. (2005) for the measurement of writing complexity, came up with the following findings:

- The low-scored individualized group had higher means (pre=.812 and post= .885) than the g-wide group (pre= .714 and post= .715) on both pretest and posttest. While the high-scored individualized group on the pretest had lower means (pre=.946) than the g-wide group (pre= .995) and on the posttest had higher means (post=.934) than the g-wide group (post= .692).

- A slight increase of +.073 was there in the score of the low-scored individualized group from .812 in the pretest to .885 in the posttest. While a slight decrease of -.012 was there in the score of the high-scored individualized group from .946 in the pretest to .934 in the posttest.

- A very slight increase of +.001 was there in the score of the low-scored g-wide group from .714 in the pretest to .715 in the posttest. While a decrease of -.303 in the score of the high-scored g-wide group from .995 in the pretest to .692 in the posttest).

Therefore, it can be claimed that:

- The two types of ZPD-based instructions have significant different impacts on the writing complexity of both low scorers and high scorers. (F (1, 63) = 1.47, P = .230) for low scorers vs. (F (1, 51) = 4.580, P= .037) for high scorers.

- They have different positive impacts on the writing complexity of low-scorers while having different negative impacts on the writing complexity of high scorers.

- The I-ZPD-based instruction developed (increased) slightly (+.073) the mean scores

of the low scorers, while declining slightly (-.012) the mean scores of the high scorers.

- The g-wide ZPD-based instruction developed (increased) very slightly (+.001) the mean scores of the low scorers while declining (-.303) the mean scores of the high scorers.

Evidently, for the low-scorers, the I-ZPD-based instruction was more constructive to their writing complexity than the g-wide ZPD-based instruction (respectively increasing their mean scores as +.073 vs. +.001). While for the high scorers, the g-wide ZPD-based instruction seemed less constructive, if not destructive, than the I-ZPD-based instruction (respectively decreasing their mean scores as -.303 vs. -.012).

As to the third and the fourth secondary research questions on 1) the effect of the G-wide ZPD-based instruction, and 2) the effect of the I-ZPD-based instruction on the writing complexity of the low scorers compared to high scorers, the respective ANCOVA revealed that:

- The high-scorers of both groups (g-wide and individualized) had higher means (Gw=.995 and I=.946) than the low scorers of both groups (Gw=.714 and I= .812) on the pretest.

- The high scorers of the g-wide group had lower means (.692) than the low scorers of the g-wide group (.715) on the posttest. While high scorers of the I-group had a higher mean (.934) than the low scorers of the I-group (.885) on the posttest.

- A decrease of -.303 was there in the score of the high-scored g-wide group from .995 in the pretest to .692 in the posttest. While a slight decrease of -.012 was there in the score of the high-scored I-group from .946 in the pretest to .934 in the posttest.

- A very slight increase of +.001 was there in the score of the low-scored g-wide group from .714 in the pretest to .715 in the posttest. While a slight increase of +.073 was there in the score of the low-scored I-group from .812 in the pretest to .885 in the posttest.

Therefore, it can be claimed that:

- The two types of ZPD-based instructions had significantly different impacts on the writing complexity of EFL high scorers compared to low scorers.

- They have a positive impact on the writing complexity of the low scorers while having a negative impact on the writing complexity of high scorers.

- The g-wide ZPD-based instruction very slightly developed the scores of the low scorers (+.001), while declining the scores of the high scorers (-.303).

- The I-ZPD-based instruction developed slightly the scores of the low scorers (+.073) while declined slightly the scores of the high scorers (-.012).

Evidently, the g-wide ZPD-based instruction showed less constructive to the writing complexity of the high scorers (-.303) while being very slightly constructive to the writing complexity of the low scorers (+.001). And, the I-ZPD-based instruction was slightly destructive to the writing complexity of the high scorers (-.012) while being slightly constructive to the writing complexity of the low scorers (+.073).

Discussion of the Results and Conclusions

In brief, two main conclusions from the above-mentioned discussion are drawn:

- I-ZPD-based instruction has positive impacts on the writing complexity of the low scorers.

- Group-wide ZPD-based instruction has negative impacts on the writing complexity of the high scorers.

The abovementioned findings generally confirm the results of previous studies on the functions of scaffolding in various forms of ZPD-sensitive instruction (e.g. Aljaafreh & Lantolf, 1994; Nassaji & Swain, 2010; Kozulin & Garb, 2002; Poehner, 2005; Ableeva, 2010; Alavi, Kaivanpanah, & Shabani 2012; Tajeddin & Tayebipour, 2012).

Interestingly, the results of the present study cast new light on the nature of ZPD, highlighting the significant difference between the two ways of its running (i.e. individualized vs. group-wide) and the achievements of the two types of EFL learners (i.e. low scorers vs. high scorers). These findings are in line with the results of the studies conducted by many other researchers on the individualized scaffolding technique of conference writing (e.g. Aljaafreh & Lantolf, 1994; De Guerrero & Villamil, 1996; Nassaji & Swain, 2010; as well as Nassaji & Cumming, 2000) and on the whole-class scaffolding technique of template studied by several other scholars (e.g. Baleghizadeh et al., 2011; Smit et al., 2013).

The findings are also in line with Tajeddin and Tayebipour (2015) who have found that scaffolding has learner-specific effects, meaning that each learner needs a specific amount of scaffolding for their ZPD to grow despite being in the same group ZPD. The findings of the present study, where it showed that the group-wide ZPD-based instruction is less constructive to the writing complexity of the high-scored learners, are somehow in contrast with the results of the study conducted by Mirzapour et al. (2015). Disregarding the proficiency level of the students, Mirzapour et al. (2015) have found that the whole-class scaffolding group

outperformed the individual scaffolding group in all four aspects of writing (i.e. lexical complexity, fluency, grammatical accuracy, and cohesion).

The findings of the present study somehow come indeed to an agreement with the findings of the research carried out by Aghaebrahimian et al. (2014). They have found a significant difference between the final writing scores of Iranian EFL learners who were assessed dynamically and those who were assessed traditionally.

Furthermore, the present study supports the notion of whole-class scaffolding (applied in the group-wide ZPD-based instruction) raised by some other researchers. Guk and Kellogg (2007) showed the practicality of whole-class scaffolding in the speech of language learners through teacher-led and student-led interaction. In fact, their study on the comparison of two types of scaffolding (teacher-led vs. peer-led) revealed that these two types of scaffolding constructed different ends of the same whole-class ZPD-based instruction. Similarly, the present study illuminates the nature of whole-class scaffolding from a different perspective by comparing it with conference writing scaffolding used in the I-ZPD-based instruction and comparing their effects on the writing complexity of the two types of EFL learners (i.e. low-scorers and high-scorers).

Implications and Limitations

The present study entails certain implications. Theoretically, the study opens further horizons for research on the role of the mentioned instructions in learners' cognition as some unexpected results emerged which are in need of empirical evidence and sound arguments. Pedagogically, teachers can cautiously apply two types of scaffolding (used in the two types of ZPD-based instructions; i.e. group-wide and individualized) as to the writing complexity of the relevant low- and high-scored EFL learners as findings like these are in need of further verification. The merit of these two types of ZPD-based instructions is that they challenge the writing complexity of the two types of EFL learners differently but in their ZPD providing guided free exploration.

Contrary to these theoretical developments, the present study was limited by the instructional limitations as any mental and cognitive changes happen in the course of longitudinal studies. Methodologically, it was rather difficult to draw crystal-clear borderline on the instruction types, contrary to the best efforts. Moreover, certain unknown and unexpected variables emerged in the course of the study which are suggested to be explored more in the future.

AREL

References

Ableeva, R. (2010). Dynamic Assessment of Listening Comprehension in Second Language Learning. *Penn State University Libraries.* https://etda.libraries.psu.edu/catalog/11063

Aghaebrahimian, A., Rahimirad, M., Ahmadi, A., & Alamdari, J. (2014). Dynamic Assessment of Writing Skill in Advanced EFL Iranian Learners. *Elsevier Ltd*, 98, 60-67.

Alavi, S. M., Kaivanpanah, S., & Shabani, K. (2012). Group Dynamic Assessment: An Inventory of Meditational Strategies for Teaching Listening. *Journal of Teaching Language Skills, 30(4), 27-58.*

Aljaafreh, A., & Lantolf, J. P. (1994). Negative Feedback as Regulation and Second Language Learning in the Zone of Proximal Development. *The modern language journal, 78(4), 465-483.*

Azari, T. M., & Pouyan, A. (2016). The Effects of Peer-Mediated and Individual Writing Conditions on the Fluency, Complexity, and Accuracy of Iranian EFL Learners' L2 Writing. *Journal of Applied Linguistics and Language Research, 3(4), 163-174.*

Baleghizadeh, S., Timcheh Memar, A., & Timcheh Memar, H. (2011). A Sociocultural Perspective on Second Language Acquisition: The Effect of High-Structured Scaffolding vs. Low-Structured Scaffolding on the Writing Ability of EFL Learners. *Reflection on English Language Teaching, 10(1), 43-54.*

Birjandi, P., & Daftarifard, P. (2011). Potential Predictability of ZPD of Children's Cognitive Development. *Broad Research in Artificial Intelligence and Neuroscience (BRAIN), 2(2), 41-50.*

Blankenship, J. M., & Wilson, E. K. (2009). *Teaching Writing and Research Skills in an Undergraduate Public Administration Class.* http://citation.allacademic.com/meta/p282955_index.html

Byrd, D. (2008). Practical Tips for Implementing Peer Editing Tasks. *Foreign Language Annals,* 36(3), 434-441.

Connor, U., & Mbaye, A. (2002). Discourse Approaches to Writing Assessment. *Annual Review of Applied Linguistics.* Cambridge University Press. https://scholarworks.iupui.edu/bitstream/handle/1805/2661/Connor_Discourse_Approaches.pdf

De Guerrero, M. C. M., & Villamil, O. S. (1994). Social-cognitive dimensions of interaction in L2 peer revision. *The Modern Language Journal*, 78(4), 484–496.

De Guerrero, M. C. G., & Villamil, O. S. (1996). Peer Revision in the L2 Classroom: Social-Cognitive Activities, Mediating Strategies, and Aspects of Social Behavior. *Journal of Second Language Writing. Elsevier,* 5(1), 51-75.

Dodge, Y. (2008). *The Concise Encyclopedia of Statistics*. Springer, New York, NY.

Ellis, R. (2003). *Task-Based Language Learning and Teaching.* Oxford University Press.

Ellis, R. (2008). *The Study of Second Language Acquisition (*2nd ed.). Oxford University Press.

Ellis, R., & Barkhuizen, G. (2005). *Analyzing Learner Language.* Oxford University Press.

Fernández Dobao, A. (2012). Collaborative Writing Tasks in the L2 classroom: Comparing group, pair, and individual work. *Journal of Second Language Writing. Elsevier,* 21(1), 40-58.

Ferris, D. (1999). The Case for Grammar Correction in L2 Writing Classes: A Response to Truscott. *Journal of Second Language Writing,* 8(1), 1-11.

Fontanini, I., Weissheimer, J., Bergsleithner, J. M., Perucci, M., & Dely, R. (2005). Memòria de trabalho e desempenho em tarefas de L2. *Revista Brasileira de Lingüistica Aplicada.* https://www.redalyc.org/pdf/3398/339829597009.pdf

Freund, R. J., Wilson, W. J., & Mohr, D. L. (2010). *Statistical Methods (Third Ed.)*. Elsevier Inc.

Guk, L., & Kellogg, D. (2007). The ZPD and Whole-class Teaching: Teacher-led and Student-led Interactional Mediation Of Tasks. *Language Teaching Research,* 11(3), 281-299.

Gregersen, T. S. (2003). To err is human: A reminder to teachers of language-anxious students. *Foreign Language Annals,* 36(1), 25-32.

Hapsari, A. S. (2011). The use of roundtable techniques to improve students' achievement in writing hortatory exposition text. *Theory and Practice in Language Studies* http://lib.unnes.ac.id/6829/1.haspreviewThumbnailVersion/7894.pdf.

Hasani, M. T., & Moghadam, C. R. (2012). The effect of self-assessment on Iranian EFL learners' writing skills. *The Iranian EFL Journal.* https://s3.amazonaws.com/academia.edu.documents/39133463/

Housen, A. K. (2009). Complexity, Accuracy, and Fluency in Second Language Acquisition. *Applied Linguistics,* 30(4), 461–473.

Jalili, H. M., & Shahrokhi, M. (2017). Impact of Collaborative Writing on the Complexity, Accuracy, and Fluency of Iranian EFL Learners' L2 Writing. *Journal of Applied*

Linguistics and Language Research. https://pdfs.semanticscholar.org/0609/3d880069ea4007ed089cb3cb5c95f586ae1f.pdf

Kepner, C. (1991). An Experiment in the Relationship of Types of Written Feedback to the Development of Second-Language Writing Skills. *The Modern Language Journal, 75(3), 305-313.*

Kozulin, A., & Garb, E. (2002). Dynamic Assessment of EFL Text Comprehension. *School Psychology International,* 23(1), 112-127.

Lantolf, J. P. (1994). Erratum: The Tapestry of Language Learning: Individual in the Communicative Classroom. *Studies in Second Language Acquisition.* https://www.jstor.org/stable/44487758

Lockhart, C. N. (1995). Analyzing Talk in Peer Response Groups: Stances, Functions, and Content. *Language Learning*, 45(4), 605-651.

Mangelsdorf, K., & Schlumberger, A. (1992). ESL Student Response Stances in a Peer-Review Task. *Journal of Second Language Writing,* 1(3), 235-254.

McGroarty, M.E., & Zhu, W. (1997). Triangulation in Classroom Research: A Study of Peer Revision. *Language Learning,* 47(1), 1-43.

Mirzapour, F., Ahangari, S., & Saeidi, M. (2015). Individual vs. Whole-Class Scaffolding and Second Language Writing. *DU Journal of Humanities and Social Sciences.* http://dujournals.eu.pn/Special-issues/

Miri, M., Alibakhshi, G., Kushki, A., & Bavarsad, S. P. (2017). Going beyond One-to-One Mediation in Zone of Proximal Development (ZPD): Concurrent and Cumulative Group Dynamic Assessment. *Eurasian Journal of Applied Linguistics,* 3(1), 1– 24.

Nassaji, H., & Cumming, A. (2000). What's in a ZPD? A Case Study of a Young ESL Student and Teacher Interacting Through Dialogue Journals. *Language Teaching Research*, 4(2), 95-121.

Nassaji, H., & Swain, M. (2010). A Vygotskian Perspective on Corrective Feedback in L2: The effect of Random Versus Negotiated Help on the Learning of English Articles. *Language Awareness,* 9(1), 34-51.

Penrose, L. S., & Raven, J. C. (1936). A New Series of Perceptual Tests: Preliminary Communication. *British Journal of Medical Psychology,* 16(2), 97-104.

Poehner, M. E. (2005). Dynamic Assessment of Oral Proficiency among Advanced L2 Learners of French. *Penn State University Libraries.* https://etda.libraries.psu.edu/catalog/6627

Polio, C. G. (2001). Second Language Development in Writing: Measurement of fluency, Accuracy, and Complexity. *Studies in Second Language Acquisition*, 23(3), 423-425.

Raven, J. R. (1998). Manual for Raven's progressive matrices and vocabulary scales. Section 1, general overview: introducing parallel versions of the CPM and SPM together with a more powerful version of the SPM (SPM plus). *Oxford Psychologists*. https://trove.nla.gov.au/version/217571396

Richards, J. C., & Renandya, W. A. (2010). *Methodology in Language Teaching: An Anthology of Current Practice.* Cambridge University Press.

Rumisek, L.A., & Zemach, D. E. (2005). *Academic Writing from Paragraph to Essay.* Macmillan Education.

Shepard, L. A. (2005). The Role of Assessment in a Learning Culture. *Educational Researcher,* 29(7), 4-14.

Skehan, P. (1996). A Framework for the Implementation of Task-based Instruction. *Applied Linguistics,* 17(1), 38–62.

Skehan, P., & Foster, P. (1997). Task Type and Task Processing Conditions as Influences on Foreign Language Performance. *Language Teaching Research,* 1(3), 185-211.

Skehan, P. (1998). *A Cognitive Approach To Language Learning.* Oxford University Press.

Skehan, P. (2009). Modeling Second Language Performance: Integrating Complexity, Accuracy, Fluency, and Lexis. *Applied Linguistics*, 30(4), 510–532.

Smit J., Eerde H. A. A., & Bakker A. (2013). A Conceptualization of Whole-Class Scaffolding. *British Educational Research Journal,* 39(5), 817-834.

Tajeddin, Z., & Tayebipour, F. (2012). The Effect of Dynamic Assessment of EFL Learners' Acquisition of Request and Apology. *The Journal of Teaching Language Skills,* 31(2), 87-118.

Tajeddin, Z., & Tayebipour, F. (2015). The Interface between L2 Learners' Pragmatic Performance, language Proficiency, and Individual/Group ZPD. *Applied Research on English language, 4(1), 31-44.*

Truscott, J. (1996). The Case against Grammar Correction in L2 Writing Classes. *Language Learning,* 46(2), 327-369.

Truscott, J. (1999). The Case for "The Case against Grammar Correction in L2 Writing Classes‖": A Response to Ferris. *Journal of Second Language Writing, 8(2), 111-122.*

Van Der, S., & Rachel, R. (2002). Scaffolding as a Teaching Strategy. *Adolescent Learning and Development, 52*(3), 5-18.

Vygotsky, L. S. (1978). *Mind in Society: Development of Higher Psychological Processes* (Cole M., Jolm-Steiner V., Scribner S., & Souberman E., Eds.). Cambridge, Massachusetts; London, England: Harvard University Press.

Widdowson, G. H. (1990). *Aspects of Language Teaching.* Oxford University Press.

Wigglesworth, G., & Storch, N. (2009). Pair versus Individual Writing: Effects on Fluency, Complexity, and Accuracy. *Language Testing*, 26(3), 445-466.

Wood, D., Bruner, J., & Ross, G. (1976). The Role of Tutoring in Problem Solving. *Journal of Child Psychology and Psychiatry,* 17(2), 89-100.