Measurement and incorporation of ZPD scenarios in developing writing accuracy in EFL classes

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Samaneh Nazerian¹, Gholam-Reza Abbasian²* and Ahmad Mohseni²

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 study the applicability of the two scenarios of ZPD-based instructions to the writing accuracy of two levels of Iranian EFL learners (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 which, respectively, received compatible ZPD-based instructions (i.e., individualized—I—and group-wide—GW) utilizing conference writing (as an individual scaffolding technique) and structured writing templates (as a whole-class scaffolding technique). The treatments were rendered to the groups in a random manner within homogeneous blocks. Before and after the treatments, three tests (two writing tests and one ZPD test) were administered to measure both groups’ writing abilities (i.e., accuracy) and their ZPD levels. A ZPD test was also administered in the middle to measure the usefulness of I-ZPD-based instruction. The non-parametric analysis of covariance (ANCOVA) indicated that the ZPD was significantly more applicable than the instructional group to improve writing accuracy of the low-scorers and the high-scorers.

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PUBLIC INTEREST STATEMENT

The present research was conducted to improve writing accuracy of EFL learners through focusing first on measuring each learner’s individualized ZPD and then on their group-wide ZPD or average ZPD, and second on the feasibility and applicability of each ZPD scenarios to the writing accuracy of two levels of learners (low vs. high scorers), hoping that the results would have practical implications for the EFL teachers and syllabus designers. Two experimental groups received two types of ZPD-sensitive instructions (individualized and group-wide i.e. respectively provided with conference writing and writing templates as scaffolding techniques). The findings supported the feasibility and applicability of group-wide ZPD and I-ZPD approach and revealed that integration of ZPD measurement and provision of two types of scaffoldings in the learners’ ZPD with teaching two levels of learners is an innovative trend in FL education which results in a significant difference between the two groups at performing writing.
uselessness of group-wide ZPD-based instruction to the writing accuracy of both the low and high scorers. The findings yield support to the use of ZPD-based instructions in TEFL writing and thereby affecting the learners' writing accuracy. The study; indeed, yield support to the feasibility of GW-ZPD measurement along with I-ZPD approach.

**Subjects: Teaching & Learning - Education; Social Theory; Intelligence Testing & Assessment; Education Studies; International &Comparative Education; Teaching Assistants; Classroom Practice; Assessment & Testing; Teaching & Learning; Language Teaching & Learning**

**Keywords: Individualized-ZPD-based instruction; Group-Wide-ZPD-based instruction; scaffolding; sociocultural theory; writing accuracy**

1. **Introduction**

Vygotsky's Socio-Cultural Theory (SCT) (Vygotsky, 1978) is regarded as a major breakthrough in the field of social psychology contributing to education in general and to language education in particular. SCT is based on certain macro principles mainly including developmental analysis of mental program, 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 & 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 et al. (1976) argued that scaffolding is the way an expert helps a 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 Balezghizadeh et al. (2011), there are six levels of feedback from implicit to explicit level. Widdowson (1990), indeed, asserted that scaffolding 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 (Kepner, 1991; Ferris, 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 and Ng (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 provide to their peers, a state of commitment and interest is fostered which creates a richer learning environment (M. C. M. 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 & Renandya, 2002). 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 second or foreign language (Gregersen & Horwitz, 2002). At the same time, writing is often considered the most difficult skill to be mastered (Hapsari, 2011). 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 now 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; House & Kuiken, 2009). And, writing accuracy is usually viewed as an important concern in EFL writing classrooms. Students’ writing performance is usually evaluated based on how accurate they are in lexicogrammatical areas, spelling, and punctuation. Writing accuracy refers to “the extent to which the language produced conforms to the target language norms” (Skehan, 1996, p. 232). Skehan (1996), indeed, defined accuracy as a characteristic concerning “a learner’s capacity to handle whatever level of inter-language complexity s/he has currently attained” (p. 46); that is, how similar produced language is to the target language. Accuracy refers to the production of error-free language. It is estimated by considering the percentage of error-free clauses (Skehan, 1996) and the percentage of correct use of target features (Crocket, 1989, as cited in Ellis, 2003). Larsen-Freeman (2006) defined writing accuracy as the proportion of error-free T-units to total T-units (in terms of lexical, morphological, and syntactic errors).

As far as language education in Iran is concerned, several studies have been conducted on the application of SCT. Investigating the impact of two types of group-dynamic assessments—DA—(i.e. concurrent and cumulative) by Miri et al. (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 Jalli 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 Aghaebradhimian et al. (2014), along with the impacts of whole-class and individual scaffolding 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 et al. (2015) are amongst them.

As it has been discussed in previous paragraphs, scaffolding associates peer-and cooperative endeavor on one hand and its implementation seems unimaginable in the absence of ZPD measurement and operationalization. Analogous to society, 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 at 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 inter-personal 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 & 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 accuracy) 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. accuracy) of Iranian EFL learners in terms of learners’ levels (i.e. low and high scorers).

In order to accomplish these objectives, the present study, focused first and foremost on measuring each target learner’s individual ZPD and then on their group-wide ZPD or average ZPD, and second on the feasibility and application of each ZPD scenarios in developing writing accuracy 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 accuracy of Iranian EFL learners in terms of learners’ levels (low vs. high scorers)?

(1) Do group-wide ZPD-based instruction and individualized-ZPD-based instruction have a different impact on the accuracy of EFL low scorers’ writing?

(2) Do group-wide ZPD-based instruction and I-ZPD-based instruction have different impact on the accuracy of EFL high-scored learners’ writing?

(3) Does group-wide ZPD-based instruction have significantly different effect on low scorers compared to high scorers in developing their writing accuracy?

(4) Does individualized-ZPD-based instruction have significantly different effect on low scorers compared to high scorers in developing their writing accuracy?

On the limitation of the study, to the researcher’s knowledge, a poor variety of scaffolding techniques used for comparing individualized ZPD instruction with g-wide ZPD-based instructions were among the main limitations imposed on the study. The 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. Practical limitations, such as the small size of the sample, time shortage, the researcher’s personal limitations, her working conditions have also strongly limited the scope of the study, and then the external validity. Lack of due cooperation of some of the learners under the treatment, teaching scholars and researchers as inter-raters in line with boosting the reliability of the findings were also among other limitations the researcher has faced with. Therefore, drawing any general conclusion based on the findings of the study might be tentative.

The researcher has, indeed, purposefully delimited the age of the sample of the study (adult learners—from 18 to 30) to compare the amount of the adult learners’ ZPD development being affected by two types of ZPD-based instructions (i.e., individualized vs. group-wide). And accordingly, the project took place deliberately at the foreign language department of an Islamic Azad University in Tehran. The scope of the research has been also delimited to the study of writing skills, disregarding other three language skills. Writing skills of the Iranian English learners (who are natively Persian speakers and learn English as a foreign language) were studied. And the learners’ writing abilities in terms of the just one out of four competences suggested by Connor and Mbayé (2002) for writing difficulties i.e., grammatical accuracy, which were equal to Wigglesworth and Storch (2009) categorization of accuracy was chosen to be compared. The study has also relied only on two types of scaffolding techniques (i.e., writing conference and template, applied respectively in individualized ZPD-based instruction and group-wide ZPD-based instruction). Other significant factors such as learners’ social factors e.g., gender, age, religion, culture, and personality types, self-esteem, as well as creativity, which are considered as individual differences and highlighted by Dornyei (2005), affecting deeply language learning skills particularly writing, have not been studied either and are suggested to be explored in the future by the interested scholars.
2. Methodology

2.1. 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' levels (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 et al. (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 high 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).

2.2. 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 majoring in Translation Studies from a university in Tehran were selected based on convenient sampling. 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.

2.3. Instrumentation and materials

2.3.1. TOEFL ITP
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).

2.3.2. 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 and opinion essay test, consisting of writing tasks (reading passages and recorded lecture) and opinion essay.

(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.

2.3.3. Raven's Standard Progressive Matrices (SPM)

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

2.3.4. Kozulin and Grab's framework

Kozulin and Grab (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 as follows:

\[ LPS = \frac{S_{post} - S_{pre}}{S_{max}} + \frac{S_{post}}{S_{max}} = 2S_{post} - S_{pre} \]

2.3.5. 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 written instructions (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 Zemach and Rumisek (2005), a temporary lesson plan for 12 sessions of treatment in advanced writing 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.

2.3.6. Writing competence and indicators

Whereas writing indicators such as complexity and fluency were studied in many prior studies on oral performance, scaffolding writing and collaborative writing (e.g., Skehan, 2009; Tavakoli & Rezazadeh, 2014; Storch, 2005; Wolfe-Quintero et al., 1998, as cited in Polio, 2001; Fernández Dobao, 2012), learners’ writing quality investigated and measured by means of one out of four competences suggested by Connor and Mbaye (2002) for writing difficulties i.e. grammatical accuracy, which is equal to Wigglesworth and Storch (2009)’s writing indicators of accuracy. Accuracy of the writings was measured based on the criteria proposed by Wigglesworth and Storch (2009), through the proportion of error-free clauses to all clauses. Errors, according to them, were either errors of syntax (e.g., errors in word order and missing elements) or errors of morphology (e.g., errors in use of articles and prepositions, verb tense, subject-verb agreement and errors in word forms).

2.4. Procedure

2.4.1. Sampling

Sampling a homogeneous group of 118 students based on their performance on the TOEFL ITP and forming them randomly into 2 experimental groups.

2.4.2. Administering pre- and posttests

Administering three pre- and post-tests (two writing tests and 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’s 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.

2.4.3. Administering 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. 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’s 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.

2.4.4. 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 et al., 1998)—was assessed and analyzed taking advantage of Kozulin and Garb (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 accuracy (r (27) = .73, 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 accuracy). 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 semester’s participants of the study indicated that there were significant agreements between the scores of their writing accuracy (r (28) = .84, 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 accuracy) as well.

3. Results

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. In other words, the two experimental groups were homogenous at the beginning of the study. Based on the analysis, and according to the t-test and P-value, the differences between the two groups were not significant.
In other words, the two treatment groups were homogenous at the beginning of the study.

3.0.5. First secondary research question
A nonparametric analysis of covariance (ANCOVA) was run to compare the low-scored group-wide ZPD-based instruction and I-ZPD-based instruction groups’ performance in posttest of accuracy while controlling for the effect of pretest in order to probe secondary RQ 1. Table 1 displays the descriptive statistics for the two groups in the pretest and the posttest of accuracy, showing that while the two groups had almost the same means in the pretest of accuracy (GW = 0.466 vs. I = 0.465), the low-scored g-wide group had a lower mean in the posttest than the low-scored individualized group (GW = 0.330 vs. I = 0.468).

As it is shown in the Figure 1:

- A very slight difference was there in the means of individualized group and g-wide group in the pretest (I = 0.465 vs. GW = 0.466).
- The low-scored individualized group had higher means (0.468) than the low-scored g-wide group (0.330) in the posttest.

| Table 1. Descriptive statistics; pretest and posttest of accuracy by groups (low-scored) |
|---|---|---|---|---|---|
| Groups | N | Minimum | Maximum | Mean | Std. Deviation |
| G-Wide Pre-Accuracy | 48 | 0.00 | 1.20 | 0.4662 | 0.31,102 |
| Post-Accuracy | 48 | 0.00 | 1.33 | 0.3304 | 0.29,374 |
| Individualized Pre-Accuracy | 17 | 0.11 | 0.81 | 0.4653 | 0.22,288 |
| Post-Accuracy | 17 | 0.14 | 0.80 | 0.4688 | 0.22,986 |

| Table 2. Nonparametric analysis of covariance; pre- & post-tests of accuracy by groups (low scorers) |
|---|---|---|---|---|
| F | DFH | DFE | P Value |
| 4.887 | 1 | 63 | 0.031 |

Figure 1. Pretest & posttest of accuracy by groups (low-scored).
A decrease of $-0.136$ was there in the scores of low-scored g-wide group from $0.466$ in the pretest to $0.330$ in the posttest.

A very slight increase of $+0.003$ was there in score of low-scored individualized group from $0.465$ in the pretest to $0.468$ in the posttest.

Table 3. Descriptive statistics; pretest and posttest of accuracy by groups (high-scored)

| Groups  | N   | Minimum | Maximum | Mean   | Std. Deviation |
|---------|-----|---------|---------|--------|----------------|
| G-Wide  | Pre-Accuracy | 26 | 0.14 | 1.14 | 0.5038 | 0.29,877 |
|         | Post-Accuracy | 26 | 0.00 | 1.00 | 0.4662 | 0.28,980 |
| Individualized | Pre-Accuracy | 27 | 0.00 | 0.92 | 0.4889 |
|         | Post-Accuracy | 27 | 0.09 | 0.93 | 0.4104 | 0.24,192 |

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

Table 4. Nonparametric analysis of covariance; pretest & posttest of accuracy by groups (high scorers)

| F   | DFH | DFE | P Value |
|-----|-----|-----|---------|
| 0.660 | 1 | 51 | 0.420 |

- A decrease of $-0.136$ was there in the scores of low-scored g-wide group from $0.466$ in the pretest to $0.330$ in the posttest.
- A very slight increase of $+0.003$ was there in score of low-scored individualized group from $0.465$ in the pretest to $0.468$ in the posttest.

Figure 1 displays the two groups’ means in pretest and posttest.

Table 2 displays the results of non-parametric ANCOVA ($F(1, 63) = 4.88, p = 0.031$) as well. Based on the data indicated in the Tables 1 and Tables 2, and the Figure 1, it can be said that these two types of ZPD-based instruction (i.e., group-wide and individualized) have “different” impact on the writing accuracy of the low scorers. Thus, the first minor null-hypothesis was rejected.

3.0.6. Second secondary research question

A nonparametric analysis of covariance (ANCOVA) was run to compare the high-scored group-wide ZPD-based instruction and I-ZPD-based instruction groups’ performance on the posttest of accuracy while controlling for the effect of the pretest in order to probe secondary RQ 2. Table 3 displays the descriptive statistics for the two groups in the pretest and the posttest, showing that both g-wide and individualized groups had lower means on the posttest of accuracy than pretest.
The g-wide group’s means in the pretest and the posttest were respectively 0.503 and 0.466, while the individualized group’s means were 0.488 and 0.410 in the pretest and the posttest.

As it is shown in the Figure 2:

- The high-scored individualized group had somehow a lower means (pre = .488) than the high-scored g-wide group (0.503) in the pretest.
- The high-scored individualized group had lower means (0.410) than the g-wide group (0.466) in the posttest.
- A slight decrease of −0.037 was in the score of high-scored g-wide group from 0.503 in the pretest to 0.466 in the posttest.
- A slight decrease of −0.078 was there in the score of high-scored individualized group from 0.488 in the pretest to 0.410 in the posttest.

Figure 2 displays the two groups’ means in pretest and posttest.

Table 4 displays the results of non-parametric ANCOVA (F (1, 51) = 0.660, p = .420) as well. Based on the data indicated in the Tables 3 and Tables 4, and Figure 2, it can be said that these two types of ZPD-based instructions (i.e., group-wide and individualized) had “different” effect on the writing accuracy of the high scorers. Thus, the second minor null-hypothesis was rejected.

As to the first and the second secondary research questions about the impact of the two types of ZPD-based instructions on the writing accuracy of Q1. the low-scored learners, and Q2. the high-scored learners, the researchers taking advantage of the criteria proposed by Wigglesworth and Storch (2009) for the measurement of writing accuracy, came up with the findings shown on the Table 5:

Based on the tables of 2, 4, and 5, it can be claimed that:

- The two types of ZPD-based instructions have different impacts on the writing accuracy of both the low-scored (F (1, 63) = 4.88, p = 0.031) and the high-scored learners (F (1, 51) = 0.660, p = 0.420).
- The group-wide ZPD-based instruction has a “negative” impact on the writing accuracy of the low scorers (−0.136), while having a “small negative” impact on the writing accuracy of the high scorers (−0.037). The I-ZPD-based instruction has a “very small positive” impact on the writing accuracy of the low scorers (+0.003) while having “a small negative” impact on the writing accuracy of the high scorers (−0.078).

| Table 5. Parametric study of 2 types of ZPD based instructions on writing accuracy of Q1. The low-scored learners, and Q2. the high-scored learners |
|---------------------------|-----------------|-----------------|-----------------|-----------------|
| **Levels** | **Groups** | **Tests** | **Mean** | **Change rate** |
| High scorers | G-Wide | Pre-accuracy | 0.5038 | −0.0376 |
| | Post-accuracy | 0.4662 | |
| | Individualized | Pre-accuracy | 0.4889 | −0.0785 |
| | Post-accuracy | 0.4104 | |
| Low scorers | G-Wide | Pre-accuracy | 0.4662 | −0.1358 |
| | Post-accuracy | 0.3304 | |
| | Individualized | Pre-accuracy | 0.4653 | 0.0035 |
| | Post-accuracy | 0.4688 | |
The I-ZPD-based instruction developed “very slightly” (+0.003) the mean scores of the low-scored learners, while declining “slightly” (−0.078) the mean scores of the high-scored learners.

The group-wide ZPD-based instruction declined (−0.136) the mean score of the low-scored learners, while declining “slightly” (−0.037) the mean score of the high-scored learners.

Evidently, the I-ZPD-based instruction helped the low-scored learners outperform group-wide ZPD-based instruction group on the accuracy of writing (+0.003 vs. −0.136). While the I-ZPD-based instruction acted as a stronger deterrent against writing accuracy of the high-scored learners than the group-wide ZPD-based instruction (−0.037 vs. −0.078).

3.0.7. Third secondary research question
A nonparametric analysis of covariance (ANCOVA) was run to compare the low and high-scored group-wide ZPD-based instruction groups’ performance in the posttest of accuracy while controlling for the effect of pretest in order to probe secondary RQ 3. Table 6 displays the descriptive statistics for the two groups in the pretest and the posttest, showing that both the low and high-scored g-wide groups had lower means in the posttest than the pretest; moreover, the low-scored g-wide group’s means in the pretest (0.466) and the posttest (0.330) were lower than the high-scored group’s means in the pretest and the posttest (0.503 and 0.466 respectively).

As it is shown in the Figure 3:
• The high-scored g-wide group had a little bit higher mean (0.503) than the low-scored g-wide group (0.466) in the pretest.
• The high-scored g-wide group had higher mean (0.466) than the low-scored g-wide group (0.330) in the posttest.
• A slight decrease of −.037 was there in the score of the high-scored g-wide group from 0.503 in the pretest to 0.466 in the posttest.
• A decrease of −.136 was there in the score of the low-scored g-wide group from 0.466 in the pretest to 0.330 in the posttest.

Figure 3 displays the two groups’ means in pretest and posttest.

Table 7 displays the results of non-parametric ANCOVA (F (1, 72) = 3.40, p = 0.069) as well. Based on the data indicated in Tables Tables 6 and Tables 7, and Figure 3, it can be said that the g-wide ZPD-based instruction had different effect on the writing accuracy of the high-scored learners compared to low-scored learners. Thus, the third minor null-hypothesis was rejected.

3.1. Forth secondary research question
Similarly, a nonparametric analysis of covariance (ANCOVA) was used to compare the low- and high-scored I-ZPD-based instruction groups’ performance in the posttest of accuracy while controlling for the effect of the pretest in order to probe secondary RQ 4. Table 8 displays the descriptive statistics for the two groups in the pretest and the posttest, showing that high-

| Levels | N | Minimum | Maximum | Mean  | Std. Deviation |
|--------|---|---------|---------|-------|----------------|
| Low    |   |         |         |       |                |
| Pre-Accuracy | 17 | 0.11    | 0.81    | 0.4653| 0.22288        |
| Post-Accuracy | 17 | 0.14    | 0.80    | 0.4688| 0.22986        |
| High   |   |         |         |       |                |
| Pre-Accuracy | 27 | 0.00    | 0.92    | 0.4889| 0.24286        |
| Post-Accuracy | 27 | 0.09    | 0.93    | 0.4104| 0.24192        |

Figure 4. Pretest and posttest of accuracy by score levels (I-group).
Table 9. Nonparametric analysis of covariance; pretest & post-tests of accuracy by score levels (I-group)

| F     | DFH | DFE | P Value |
|-------|-----|-----|---------|
| 2.079 | 1   | 42  | .157    |

Table 10. Parametric study of effects of Q3. group-wide ZPD-based instruction and Q4. I-ZPD-based instruction on writing accuracy of low scorers compared with high scorers

| Groups       | Levels     | Tests         | Mean    | Change Rate |
|--------------|------------|---------------|---------|-------------|
| G-Wide High  | Low scorers| Pre-accuracy  | 0.4662  | -0.1358     |
|              |            | Post accuracy | 0.3304  |             |
|              | High scorers| Pre-accuracy  | 0.5038  | -0.0376     |
|              |            | Post accuracy | 0.4662  |             |
| Individualized| Low scorers| Pre-accuracy  | 0.4653  | 0.0035      |
|              |            | Post accuracy | 0.4688  |             |
|              | High scorers| Pre-accuracy  | 0.4889  | -0.0785     |
|              |            | Post accuracy | 0.4104  |             |

scored individualized group had almost the same means in the pretest (0.465) and the posttest (0.468). Although, the high-scored individualized group had a higher mean in the pretest (0.488), got a lower mean in the posttest (0.410) compared to the low-scored group.

As it is shown in the Figure 4:

- The high-scored individualized group had a little bit higher mean (0.488) than the low-scored individualized group (0.465) in the pretest.
- The high-scored individualized group had higher mean (0.410) than the low-scored individualized group (0.468) in the posttest.
- A slight decrease of -0.078 was there in the score of the high-scored individualized group from 0.488 in the pretest to 0.410 in the posttest.
- A very slight increase of +.003 was there in the score of the low-scored individualized group from 0.465 in the pretest to 0.468 in the posttest.

Figure 4 displays the two groups’ means in pretest and posttest.

Table 9 displays the results of non-parametric ANCOVA (F (1, 42) = 2.079, p = 0.157) as well. Based on the Tables 8 and Tables 9, and Figure 4, it can be said that I-ZPD-based instruction had different effect on the writing accuracy of the high-scored learners (negative) compared to the low-scored learners (positive). Thus, the fourth minor null-hypothesis was rejected.

As to the third and the fourth secondary research questions on 1) the effect of the group-wide ZPD-based instruction, and 2) the effect of the I-ZPD-based instruction on the writing accuracy of the low scorers compared to the high scorers, the respective ANCOVA came up with the following findings, shown on the Table 10:

Based on the tables of 7,9, and 10, it can be claimed that:

- The two types of ZPD-based instructions have a significant different impact on the writing accuracy of the high-scroers compared to the low-scroers.
• The group-wide ZPD-based instruction has a “negative” impact on the writing accuracy of the low-scorers (--0.136) and a “small negative” impact on the writing accuracy of the high scorers (--0.037), while I-ZPD-based instruction has a “very small positive” impact on the writing accuracy of the low-scorers (+0.003) and a “small negative” impact on the writing accuracy of the high-scorers (--0.078).

• The group-wide ZPD-based instruction declined the scores of the low scorers (--0.136), while declining “slightly” the scores of the high scorers (--0.037).

• The I-ZPD-based instruction developed “very slightly” the scores of the low scorers (+0.003) while declined “slightly” the scores of the high scorers (--0.078).

Evidently, the group-wide ZPD-based instruction decline “slightly” the writing accuracy of the high scorers (--0.037) and decline the writing accuracy of the low scorers (--.136). And, the I-ZPD-based instruction declined “slightly” the writing accuracy of the high scorers (--0.078) while improved very slightly the writing accuracy of the low scorers (+0.003).

4. Discussion and conclusion
In brief, two main conclusions from the above-mentioned discussion were drawn:

• The I-ZPD-based instruction has positive impacts on the writing accuracy of the low scorers.

• The group-wide ZPD-based instruction has negative impacts on the writing accuracy of the both levels of the learners (more on the low scorers than the high scorers).

The abovementioned findings in general 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 et al., 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 levels of EFL learners (i.e., low scorers vs. high scorers). These findings were 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; M. C. G. De Guererro & 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)—when they respectively concerned to the two types of ZPD-based instructions of individualized and g-wide ZPD-based instruction and their different effects on the three components of writing abilities (i.e., CAF) studied so far by several other researchers e.g., Aljaafreh and Lantolf (1994), Nassaji and Swain (2010), Kozulin and Garb (2002), Poehner (2005), Ableeva (2010), and Alavi et al. (2012) as well as Tajeddin and Tayebipour (2012).

Based on the findings of the research, the need for the expansion of ways for measuring group’s ZPD growth was arisen. It is suggested to describe “average growth of the whole class ZPD” as the newest way of measuring the group’s ZPD growth.

The findings of the present study, in fact, lend support to the fact that language learning happens in the social context and social interaction is a prerequisite for cognitive development. In addition, the results of the present study highlighted the significance of interaction and negotiation in the learning process, specifically negotiation within the learners’ ZPD. The types of collaborative negotiation provided by means of the two types of scaffolding techniques (individualized and g-wide) helped learners to move from inter-mental functioning to intra-mental functioning, which is a transition from dependency to independency.
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. Tajeddin and Tayebipour (2015) investigated the development of EFL learners’ pragmatic competence through the lens of ZPD. They have found that scaffolding has learner-specific effects, meaning that each learner needs a specific amount of scaffolding for his/her ZPD to grow. Their research was conducted to investigate (1) whether the amount of scaffolding provided to EFL learners would have any relationship with their “speaking” proficiency level, and (2) the relationship between learners’ individual ZPDs and the group ZPD. Their findings indicated no significant relationship between the proficiency level of the learners and the amount of scaffolding given to produce the two speech acts. However, they found certain relationship between learners’ individual ZPDs and their group ZPD. They suggested that EFL learners’ general language proficiency has little impact on the development of their pragmatic competence; besides, scaffolding seems to have learner-specific effects, meaning that each learner may need a specific amount of scaffolding for his/her 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 has a negative impact on the writing accuracy of the high and low scorers, are in some way in contrast with the results of the study conducted by Mirzapour et al. (2015). Disregarding the language proficiency level of learners, and their individual and group’s ZPD development, and focusing mainly on the teaching phase of language education, Mirzapour et al. (2015) investigated the effect of whole class scaffolding and individual scaffolding on the narrative writing ability of Iranian EFL learners in terms of lexical complexity, fluency, grammatical accuracy, and cohesion. They have found that the whole-class scaffolding group outperformed the individual scaffolding group in all four aspects of writing, namely lexical complexity, fluency, grammatical accuracy, and cohesion.

Furthermore, the present study supported the notion of whole-class scaffolding (applied in the group-wide ZPD-based instruction) raised by some other scholars. 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 illuminated 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 accuracy of the two levels of EFL learners (i.e., low- and high-scorers).

Therefore, it can be concluded that this research, studying the implementation and applicability of the two types of ZPD-based scenarios, measuring the growth of the two types of ZPD (individual and group), and comparing the effect of each type of ZPD-based instructions (individualized and group-wide) on the writing quality of the two levels of EFL learners (low vs. high scorers), in some way played a catalytic role in the growth of the two main fields of foreign language education (i.e., both teaching and assessment) theoretically and practically. It may provide the teachers with insights into an innovative way of teaching and assessing practice (i.e., individual, and whole-class scaffolding), an innovative way of implementing the two types of ZPD-based scenarios (individualized and group-wide ZPD-based instruction), an innovative way of measuring the two types of ZPD (individual and group) in EFL learning context. Syllabus designers can apply two types of scaffoldings (used in the two types of ZPD-based instructions; i.e., group-wide and individualized) effective for the writing accuracy of the relevant low- and high-scored EFL learners to textbooks. The merit of these two types of ZPD-based instructions is that they challenge writing accuracy of the two levels of EFL learners differently but in their ZPD providing guided free exploration.

The methodological implications of this study should be taken into consideration in the future research. Whereas, this study focused on a small number of EFL learners at different proficiency
levels in one setting, more research in the form of longitudinal studies with a larger size of sample is suggested to be conducted involving EFL learners at different age in a variety of settings.

Conducting research based on a Quan-QuaQ design and on the quality analysis of the study are, in fact, suggested. Meanwhile, replication of the study by means of the same and different theoretical frameworks, instruments (including other writing components and criteria proposed by other researchers for the measurement of writing accuracy is also recommended.

Learners’ writing abilities in terms of the three other competences suggested by Connor and Mbaye (2002) for writing difficulties i.e., grammatical and discourse competences, which were categorized by Wigglesworth and Storch (2009) as complexity and fluency besides accuracy (CAF) is suggested to be compared in the future.

Interested researchers can try other types of scaffolding techniques rather than writing conference and template, which were applied in the present study respectively in I-ZPD-based instruction and GW-ZPD-based instruction.

Other significant factors, such as learners’ age, and personality types, self-esteem, as well as creativity, which were highlighted by Dornyei (2005) affecting deeply language learning skills especially writing, can be taken into consideration in future studies.

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