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The Impact of Scaffolding Techniques on Iranian EFL Learners' Writing Ability

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Abstract. The present study was designed to explore the effectiveness of motivational, metacognitive, and technology-based scaffolding in developing English as a foreign language (EFL) in Iranian learners' writing ability. A sample of 60 EFL learners was selected to participate in this study who were selected based on their performance on the Preliminary English Test (PET). The selected participants were randomly assigned to three equal groups taking the pretest to measure their writing ability at the beginning of the study. In the technology-based scaffolding, software was designed by a computer technician consisting of different tasks. In the motivational scaffolding group, the writing instruction was based on activities, which stimulated learners' motivation. In the

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metacognitive scaffolding group, scaffolded instruction of writing was integrated into metacognitive strategies, which was designed to assist learners in planning, monitoring, and evaluating as core components of metacognitive scaffolds. Finally, the participants of all groups were asked to take the posttest of the study. The results of statistical analyses showed a significant difference among different groups in developing Iranian EFL learners' writing ability. Motivational-based scaffolding was shown to be the most effective technique in enhancing EFL learners' writing ability.

Keywords: Scaffolding, motivational-based scaffolding, metacognitive-based scaffolding, technology-based scaffolding, writing ability

1. Introduction

Over the past decades, teachers' understanding of learning was expanded, and they replaced their role of knowledge transmitters with creators of learner-centered and knowledge-centered classrooms (Bransford, Brown, & Cocking, 2000). This shift has opened more widows for scaffolding. It is assumed that paying heed to the nature and types of scaffolding and investigating their effects on EFL learners' language proficiency becomes a prerequisite for language learning.

Second language teachers use several techniques to help learners develop their grasp of the language. In this context, it appears to argue that the use of scaffolding as discussed in the Vygotskian Zone of Proximal Development (ZPD) adds a practical way to deal with language learning. In Vygotsky's opinion, scaffolding is a fundamental instrument of internalization and a central component of the formative movement in the ZPD (DeGuerrero & Commander, 2013). Vygotsky (1987) describes ZPD as the distance between the current developmental level regulated by individual problem-solving and the future developmental level defined by problem-solving under adult supervision or in a cooperative initiative with more competent peers. Vygotsky (1987) acknowledged that a few practices could be voluntarily done by an infant, which are established to be indicated as developmental outcomes. In these lines, if this is true for certain independent functions, it appears to be the same condition for various exercises produced by an infant. This way, the ZPD characterizes those capacities that have not yet been established, but are

apparently in the process of growth. These capabilities come to development later on but are in the meantime in an underdeveloped state (Vygotsky, 1987).

Alias (2012) categorized scaffolds into three major types: cognitive, metacognitive, and affective or motivational scaffolds. According to Alias (2012), while cognitive and metacognitive scaffolds provide assistance, support, hints, prompts, and suggestions about the content, resources, and strategies relevant to problem-solving and learning management, motivational scaffolds include techniques designed to maintain or improve the learner's motivational state, such as attribution or encouragement.

Alias (2012) stated that most studies in scaffolding address cognitive and metacognitive scaffolding. It was proposed to construct motivational scaffolding through tactics that elicit and reward learners' confidence and make learners' successes clearer. For the same reason, Belland, Chan Min, and Hannafin (2013) and Chen (2014) emphasized the scarcity of research on motivational scaffolds and the necessity for creating and conducting research on scaffolds that suit the motivational demands of learners. Chen (2014) emphasized the need to create scaffolds that concentrate on students' cognitive status and psychological status attributes. It was also suggested that scaffolds should be provided to motivate learners as they gain conceptual understanding. Chen (2014) drew on the notion of the zone of motivational proximal development (Brophy, 1999) and self-determination theory (Deci & Ryan, 1985) to propose the idea of developing scaffolding tactics that enhance both intrinsic and extrinsic motivation.

Writing, which was once considered the primary expertise of the privileged and well-educated individuals, has become an essential skill for people at all levels of education in today's global community. Writing is usually used in many communicative activities, such as composing academic essays, business reports, letters, reporting analyses of current events for newspapers or/and web pages, e-mails, or/and short off-line messages in widely used messenger programs. Therefore, writing expressively and effectively allows individuals from different cultures and backgrounds to communicate their thoughts and needs. Furthermore, it is

now widely recognized that writing plays an essential role in conveying information and transforming knowledge to create new knowledge. Consequently, learning to write has turned out to be a very important skill for university students in the first language, as well as the second or foreign language programs, throughout the world.

Metacognition plays a role in every stage of the writing process, from the analysis of the task and the rhetorical problem to the linguistic choices involved in putting thoughts into words to self-monitoring and revising processes that occur during and after the act of writing. Negretti (2021) highlights how metacognitive awareness of rhetorical and genre-relevant aspects such as appropriateness of topic, the purpose of the text, audience expectations, and effectiveness of argumentation imbues every moment of the writing experience and helps novice students develop a personal, agentive approach to write academic papers.

2. Review of the Literature

Scholars disagree with the definition and scale of scaffolding, but there is an increasing curiosity in using scaffolding in their research; hence this concept is sometimes used loosely (Hammond & Gibbons, 2001). Studies on the impact of scaffolding have yielded varying findings, but the majority have suggested that scaffolding successfully improves students' learning. Most experiments comparing the use and non-use of scaffolding in language teaching have found that scaffolding can help learners with different learning purposes (Chang, Sung & Chen, 2001; Ge & Land, 2003; King, 1991; Salmon, Globerson & Guterman, 1989).

Scaffolded teaching is based on the concept of the region of proximal growth of Lev Vygotsky (1978). Vygotsky (1978) states that there are two parts of the developmental stage of the learner: the "actual level of development" and the "potential level of development". The Zone of Proximal Development (ZPD) is the "distance between the actual level of development as determined by independent problem-solving and the level of potential development as determined by problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). ZPD can be defined as the region between learner act on his own and with the aid of a more experienced parent or peer.

Vygotsky claimed that 'good learning' would happen in the child's ZPD. The commitment to the learner's ability to control his/her learning and encourage the learner to do as well as possible without any help is an essential element in teaching in the ZPD. 'Fading' is a term used in the ZPD that refers to the gradual disappearance of the scaffolding provided to the learner until it is completely gone. Finally, the learner internalizes the new knowledge and becomes a self-regulating and autonomous learner.

The innovation of the ZPD must be at a preliminary stage (Holzman, 2010); specifically, this kind of imagination is not an individual trait but a social characteristic, which is not remarkable but typical (Holzman, 2010). Therefore, Holzman (2010) talked about ZPDs that are socially built relative to ZPDs generated inside the person's mind. Ellis (2004) cited ZPD as a central framework in sociocultural theory from which many fundamental principles of learning are exposed. First, it addresses why specific learners are ineffective in handling such systems after being subjected to external mediation; in other words, they cannot establish the relevant ZPD to execute the structures. Second, it explores why social assistance allows learners to excel in performing those systems but cannot be achieved individually. Finally, with the guidance of additional mediation learners, new mechanisms may be internalized to build the requisite ZPD.

According to Pearson (1996), the usefulness of scaffolding arises as the teacher holds the entire job, while the students learn to understand and handle the pieces and challenges the learner with just the proper challenge. In addition, successful L2 learning requires a set of activities and materials that L2 teachers should try to imbue in their classes. The role of technology in L2 learners' lives is unquestionable; in fact, it was believed that technology is like an earthquake that stimulates L2 learners to reshape their language learning on a new basis. Using language-learning technology (LLT) showed to be beneficial in many aspects. There are diverse instruments related to technology, for example, CDs, DVDs, headphones, data projectors as well as the internet, which can be approached for some typical activities as computer-based exercises, internet surfing, websites, online dictionaries, translator dic-

tionaries, or e-mails, chatrooms for communication with native or non-native speakers of English language around the world. These achievements brought by technology have their benefits that are illustrated as follows:

The first and significant benefit that technology has been presented is flexibility, which means that students have access to the materials in their schools or universities and any time at home (Murday, Ushida, & Chenoweth, 2008). Accordingly, teachers and students "(are getting more) active members of a community that thrives far beyond the spatial and temporal limitations of the traditional classroom" (Lee, 2005, p. 152). Moreover, it seems that students prefer to learn based on their own pace of learning and choose their specific materials based on their academic progress (Murday et al., 2008).

Technology-based scaffolding practices were planned and carried out as part of this study, which involved all presentations of various language elements, such as vocabulary, voice, writing, and open-ended, multi-choice, short response, and yes/no question exercises by computer-based applications to evaluate their success through the use of scaffolding.

Li (2017) used online writing instruction focused on instructional scaffolding and examined the usage of various scaffoldings in writing instruction to strengthen the writing ability of EFL learners. The scaffolding training was proposed to be applied in five stages: constructing: class scaffolding, developing real-world environments, individual discovery, collective learning, summarization, and evaluation.

Santoso (2010) examined the impact of scaffolding on foreign language learners' writing in a hybrid-learning situation (consisting of both online and face-to-face contact). In the classroom, new scaffolding techniques were developed and used and concluded that students had learned to rely on scaffolds and be self-sufficient, which improved pupils' effective writing abilities. Motivational-based scaffolding uses various techniques to inspire and empower learners, along with the teacher's supportive assistance, such as novels, role-plays, and ZPD-based games. In this respect, Cheung (2018), in a qualitative study, investigated the effect of instructors' use of motivational strategies on students' motivation in writing. Data were collected from 344 first-year undergraduate students

through classroom observation and surveys. The results revealed that the writing instructors' use of strategies in generating students' initial motivation in the classroom radically enhanced students' positive attitude self-confidence in the writing course.

Hasan (2018) investigated the impact of scaffolding on the development of higher-order thinking capabilities in students at tertiary levels in the university education system. He focused on both motivating and demotivational variables in scaffolding. The development of the learner's proximal index following Vygotsky's principles was also studied during this study to determine whether learners in writing process are following the teacher's implicit instructions and teachers are dealing appropriately with the deployment of scaffolding technology. The findings revealed that both teachers and students followed similar patterns in comprehending the scaffolding strategy acquiring writing abilities. He discovered that efficient motivational scaffolding approaches are the most appropriate in current L2 scenarios for addressing the challenges of students' poor and insufficient written communication abilities.

The processes described under metacognitive-based scaffolding can help us understand how awareness of genre, discourse, and rhetoric comes into play when students read and write texts in different contexts. Therefore, using scaffolding activities through a metacognitive framework provides a specific, applicable model for research purposes and can help identify how and when awareness of genre permeates learners' understanding of academic texts and their own writing choices.

Metacognitive scaffolding includes using such metacognitive techniques, such as tracking, assessing, and providing input for behaviors that allocate learning assignments and activities between the present stage and the developmental level of the ZPD learners.

In this regard, Mortazavi, Jafarigohar, Rouhi, and Soleimani (2016) investigated the effects of structuring and problematizing scaffolding mechanisms, as well as the possible moderating effect of proficiency level on writing self-regulatory skills, essay writing ability, and global planning time. In their study, 120 pre-intermediate and 120 advanced Iranian English learners participated. The researchers examined the time participants spent arranging the content in a two-session writing examina-

tion. The findings demonstrated that scaffolding mechanisms improved self-regulation and writing abilities significantly. Furthermore, scaffolding mechanisms improved the time participants spent on global planning. According to the findings, scaffolding mechanisms work best when supplied concurrently.

Valencia-Vallejo, Lpez-Vargas, and Sanabria-Rodrguez (2019) studied the effects of metacognitive scaffolding on metacognition, academic self-efficacy, and learning achievement in students with different cognitive styles in the Field Dependence-Independence (FDI) dimension when learning math content in an e-learning environment. Sixty-seven higher education students from a public university in Bogot, Colombia, participated in the study. One group of students interacted with an e-learning environment, including metacognitive scaffolding within its structure. The other group interacted with an environment without scaffolding. The results showed that scaffolding promotes significant differences in metacognitive ability, academic self-efficacy, and learning achievement. Similarly, the data showed that students with different cognitive styles achieve equivalent learning outcomes.

According to Belland et al. (2013), although all types of scaffolding are aimed at making learning activities more controlled which in turn improves success expectations and contributes to motivation. Scaffolding exercises are specially developed to assist learners in maintaining motivation and interest.

To present, much empirical research has addressed the application of scaffolding in the acquisition of writing skills; however, none of these studies have investigated the motivational element of scaffolding and its influence on the acquisition of writing abilities.

Classrooms with traditional teaching methods lack engaging strategies and learner engagement, therefore, negatively affecting learners' performance. In such settings, the learners are not familiar with their daily tasks since they are not learner-centered; therefore, more research on using teaching techniques that increase learner engagement is needed. Like those that participated in the present study, EFL learners may need different types of support to develop their language skills, just like the learners who learn a language in a supportive setting through engage-

ment and practice. This support could be achieved by scaffolding the learning context.

The present study can solve the problems of EFL teachers in decreasing the amount of instructional input to learners in-class time. This study introduces instructional scaffolds in supporting language learners when working on specific tasks such as English activities or oral discussions. Using scaffolding can help EFL learners to achieve target language structures, and in this case, to develop their writing in English classes. The present study aimed to find how technology instruments, motivational and metacognitive strategies affect Iranian EFL learners' writing, used in scaffolded instruction.

The learners' success is investigated in order to guide their learning processes, and the learners are in charge of their learning. The following research questions were posed to address the purpose of the study:

1. Does technology-based scaffolding significantly impact Iranian EFL learners' writing skills?

2. Does metacognitive-based scaffolding significantly impact Iranian EFL learners' writing skills?

3. Does motivational-based scaffolding significantly impact Iranian EFL learners' writing skills?

4. Which type of scaffolding significantly impact improving Iranian EFL learners' writing ability?

3. Method

3.1 Participants

The participants of this study were 60 Iranian EFL learners who were selected based on their performance on the Preliminary English Test (PET). The learners' level of language proficiency was intermediate, and they were randomly divided into three equal groups, consisting of 20 members, including technology-based, motivational-based, and metacognitive scaffolding. The participants' native language was Persian, with the age range between 18 and 32. The researcher and the professional EFL trainer scored the participants.

3.2 Instruments

The instruments of this study are explained as follow:

The PET was used to homogenize the subjects concerning their language abilities, (2004) edition. PET is a standard measure of language proficiency at the intermediate level; thus, the reliability and validity of the test are apparent. PET comprised four main reading, listening, writing, and speaking sections.

The reading section of the PET was used to determine the students' level of reading comprehension, composing 35 items with five different reading assignments in sections 1-5. The listening section was made up of four sections. Part 1 included 7 questions, with three photos and a short recording. Students had to pick the right photo and place a tick in the box. Part 2 consisted of six multiple-choice questions drawn from an audio segment. Part 3 contained 6 fill-in-the-blank objects that the participants listened to the audio files and filled in the missing details. There were 6 questions in part 4 where students heard dialogues and determined whether each sentence was right or wrong.

The writing part of the PET consisted of three sections. Section one consisted of five pieces about a canal boat vacation. Each query had two sentences for the participants to complete the second sentence, so that it would be the same as the first, and it was holding five points. The second section consisted of an object that requested students to e-mail to a friend about moving to a new apartment. The number of words used in writing ranged between 35 and 45 words with five marks. Part 3 had two questions that the learners were obliged to answer. Students have been asked to write a 100-word story about the most important day of their life, having 15 points, whereas the writing segment of the PET had a total of 25 points. The speech portion of the Preliminary English Test (PET) analysis comprised four sections. Each of the candidates communicated with the interlocutor asking standardized questions. The queries involved providing accurate and personal knowledge, as applicants referred to current situations, personal encounters, and future expectations.

The pretest and posttest included the writing section of The Inter-

national English Language Testing System (IELTS). The writing section consists of two tasks, which required learners to write at least 150 words for Task 1 and at least 250 words for Task 2. In Task 1, the participants presented a situation, and they were asked to write a letter requesting information or explaining the situation. The letter could be personal or semi-formal in style. In Task 2, they were asked to write an essay responding to the point of view, an argument, or a problem. The assessment was based on task achievement/response, coherence and cohesion, lexical resource, grammatical range, and accuracy.

An interview was conducted in order to seek out the participants' motivation, which made the qualitative part of the study. The kind of interview conducted in this study was a semi-structured one. In this type of interview, the whole interviewing process changed throughout the continuum of highly-structured to highly unstructured in that the predetermined questions were not necessarily asked in a fixed order but rather in a more flexible manner and consisted of five questions.

3.3 Procedure

The design of this study was a mixed-method one, sequential explanatory in particular. The exploratory sequential mixed methods design was characterized by an initial quantitative phase of data collection and analysis, followed by a qualitative data collection and analysis. The research project was conducted by administering the pretest to assess the participants' writing ability. The procedure was then presented to the classes. In a technology-based scaffolding group, the researcher attempted to explain the aims of each unit for about five minutes before beginning it. The students were told what they were going to learn at each session. After clarifying the aims, the researcher set up a multimodal curriculum presentation to cover the vocabulary segment; for example, introducing a new language by spelling and grammar, examples, graphics (pictures, sketches, videos), meaning (story, action), and so on.

Participants were presented with a handout containing the ID and password needed to access the method, writing themes, the time and date for submitting each piece of writing, and various means of contact

that students could use to inquire about potential technical issues during the study period. Five subjects for writing have been arranged in such a manner as to cover various fields of concern. The subjects ranged from space travel and technological discovery to medical science and social concerns, and the participants could explore everything relevant to the writing process in the forum.

Participants were required to write a minimum of 300 words on a specific topic each week. They were able to write it by any device that would give students enough time to complete their compositions, free of class-based constraints. When the learners submitted written work, the researcher corrected the writings in terms of substance and context, returned comments to the text, and urged the learners to re-submit their updated texts. The learners were able to view all of their previous learning with annotated notes so that they could be directed into a progressive method of writing. The researcher corrected the writings submitted by the students in the assessment part. They defined their mistakes and errors in creation, structure, grammar, and vocabulary. The participants offered individual input, and they were asked to go over the corrected writings and send them to the revision section.

In the motivational scaffolding group, writing instruction was focused on exercises that increased the learners' enthusiasm. For the writing of the instruction, the activities allocated to the class were primarily focused on the learners' interests. The task topic provided to participants was chosen engagingly and pleasantly. It included various perspectives, such as personality, relationships, daily life, eating habits, physical appearance, and professional life, in order to guarantee that both students could approach them using their present vocabulary skills and that they were at their current level of proficiency or around it. Furthermore, the learners' success in the activities was assured since they had the capability to carry out the activity without using their native language. The teacher reflected on the participants' at-home-prepared writing samples, and the gaps (lexical, functional, and organizational) were critically highlighted in such a way that the correct modeling of each mistake was presented to the participants regarding the situational use of the concepts they used in their writing samples.

Finally, in the last session, the learners were asked to take on each generic subject's imaginative role and write argumentatively about it. For example, the participants were asked to write argumentatively on the subject: imagine walking outside. The spring storm is coming; what do you see, hear, smell, taste, and touch? The participants' writing samples were then marked by the teacher and decided individually on the kinds of mistakes they had made.

In the metacognitive scaffolding group, guidance on writing, 20 minutes of each session were devoted to the explanation of writing methods, such as problem-solving tasks, challenging, teaching critical reasoning, analyzing the statements of others about their writing. The fundamentals of essay writing were then taught, and the participants were given a subject for writing. Any student could share his/her views on the proposed topics and experience of critical teaching. In order to take supervision into account, the instructor also acted as facilitator, reviewed the groups one by one, and offered feedback where appropriate. The participants listened and, if possible, made changes. They were also asked to take care of the most relevant issues addressed in the community and write a paper on the day's events for the instructor. The instructor had the position of timekeeper and was in charge of all that had occurred in the group's event. The assessment stage was the most crucial aspect that pushed the participants to read objectively while extracting the key concept and writing the most important message in their texts. Then the learners were asked to clarify the author's point of view and offer their writing essays.

Finally, participants from all groups were asked to take the research posttest. Their success in the posttest was compared to figure out their distinction. At the end of the study, all participants took part in the interview.

4. Results

Descriptive statistics of the participants' scores on the pretest are shown in Table 1.

Table 1: The Descriptive Statistics of the Participants' Scores on the Pretest

		N	Minimum	Maximum	Mean	Std. deviation
Pretest Writing (technology-based)	Rater 1	20	1	5	3.20	.51
	Rater 2	20	1	5	3.05	.83
Pretest Writing (metacognitive-based)	Rater 1	20	1	4	3.10	.87
	Rater 2	20	1	5	3.20	.86
Pretest Writing (motivational-based)	Rater 1	20	1	5	3.10	.64
	Rater 2	20	1	4	3.20	.78

In order to calculate the inter-rater reliability of the pretest scores obtained by two raters in both classes, a sequence of Pearson-product moment correlation coefficients has been developed. The findings can be seen in Table 2.

Table 2: The Inter-rater Reliability of the Pretest Writing Scores for All Groups

	Pearson Correlation	Sig. (2-tailed)
Pretest Writing (technology-based)	.996**	.000
Pretest Writing (metacognitive-based)	.965**	.000
Pretest Writing (motivational-based)	.981**	.000
**Correlation is significant at the 0.01 level (2-tailed).		

The results demonstrated a significant relationship between the pretest scores obtained by two raters in all groups and tests. Thus, the inter-rater reliability of the writing scores on the pretest was highly significant.

A one-way ANOVA was performed to ensure no significant difference between the groups regarding their language skills at the beginning of the study. The results are provided in Table 3.

Table 3: The One-way ANOVA Results of the Pretest

ANOVA					
Pretest					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.242	2	.248	.181	.969
Within Groups	156.750	58	1.375		
Total	157.992	60			

The results showed no significant difference among the three groups regarding their performance on the writing pretest ($F = .181, p < .001$). The descriptive statistics of the participants' performance on the posttest are shown in Table 4.

Table 4: The Descriptive Statistics of the Participants on the Posttest

		N	Minimum	Maximum	Mean	Std. deviation
Posttest Writing (technology-based)	Rater 1	20	3.00	7.00	4.45	1.51
	Rater 2	20	3.00	7.00	4.55	1.53
Posttest Writing (metacognitive-based)	Rater 1	20	3.00	7.00	4.70	1.37
	Rater 2	20	3.00	7.00	4.55	1.26
Posttest Writing (motivational-based)	Rater 1	20	3.00	8.00	5.00	1.64
	Rater 2	20	3.00	8.00	5.20	1.78

The inter-rater reliability of writing scores on the posttest for all groups was calculated using the Pearson correlation. The results of the statistical analyses are provided in Table 5.

Table 5: The Inter-rater Reliability of the Posttest Writing Scores for all Groups

	Pearson Correlation	Sig. (2-tailed)
Posttest Writing (technology-based)	.983**	.000
Posttest Writing (metacognitive-based)	.974**	.000
Posttest Writing (motivational-based)	.988**	.000
**. Correlation is significant at the 0.01 level (2-tailed).		

The results demonstrated a significant relationship between the posttest scores obtained by two raters in all groups. Thus, the inter-rater reliability of writing scores on the posttest for all groups was highly significant.

To verify the first research question of the study, finding the extent to which technology-based scaffolding affects Iranian EFL learners' writing ability, a paired sample t-test was conducted between the pretest and posttest writing scores of the learners. The results are shown in Table 6.

Table 6: The Paired Sample T-test Between the Writing Scores in the Technology-based Group

Paired Samples Test									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Writing (Technology-based) - Pretest	1.45000	.51042	.11413	1.21112	1.68888	12.704	19	.000

The difference between learners' pretest and posttest writing scores was significant ($t = 12.70, p < .001$). The results showed a statistically significant difference in the pretest and posttest writing scores of the participants in the technology-based scaffolding group in such a way that learn-

ers' writing ability was enhanced through the use of technology-based scaffolding in the classroom. Therefore, the use of technology-based scaffolding was effectively developed EFL learners' writing ability, and the first research question of the study was verified.

To verify the second research question of the study, finding the extent to which metacognitive-based scaffolding affects Iranian EFL learners' writing ability, a paired sample t-test was conducted between the learners' pretest and posttest writing scores. The results are shown in Table 7.

Table 7: The Paired Sample T-test Between the Writing Scores in the Metacognitive-based Group

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Writing (Technology-based) - Pretest	1.45000	.51042	.11413	1.22112	1.68888	12.704	19	.000

The results demonstrated that the difference between the learners' pretest and posttest writing scores was significant ($t = 12.70, p < .001$). The results showed a statistically significant difference in the pretest and posttest writing scores of the participants in the metacognitive-based scaffolding group in such a way that the learners' writing ability was enhanced through the use of metacognitive-based scaffolding in the classroom. Therefore, the use of metacognitive-based scaffolding was effectively developed EFL learners' writing ability, and the fourth research question of the study was verified.

To verify the third research question of the study, finding the extent to which motivational-based scaffolding affects Iranian EFL learners'

writing ability, a paired sample t-test was conducted between the pretest and posttest writing scores of learners. The results are shown in Table 8.

Table 8: The Paired Sample T-test Between the Writing Scores in the Motivational-based Group

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Writing (Motivational-based) - Pretest	2.90000	1.20961	.27048	2.33388	3.46612	10.722	19	.000

The results revealed that the difference between the learners' pretest and posttest writing scores was significant, $(t = 10.72, p < .001)$. The results showed a statistically significant difference in the pretest and posttest writing scores of the participants in the motivational-based scaffolding group in such a way that the learners' writing ability was enhanced through the use of motivational-based scaffolding in the classroom. Therefore, the use of motivational-based scaffolding was effectively developed EFL learners' writing ability, and the third research question of the study was verified.

To verify the fourth research question of the study, finding which type of scaffolding has a more significant effect on improving Iranian EFL learners' writing ability, a two-way ANOVA was conducted to compare the pretest and posttest writing scores of the learners in three study groups. The study's independent variables were the technology-based, metacognitive-based, and motivational-based scaffolding groups. The dependent variables were the pretest and posttest writing scores. The major assumptions for a two-way ANOVA between groups needed to be

checked, including the level of measurement, random sampling, independence of observations, normal distribution, and homogeneity of variance. To assume the normality of the scores, a one-sample Kolmogorov-Smirnov test was performed, and the results are shown in Table 9.

Table 9: Kolmogorov-Smirnov Test for Pretest and Posttest Scores in Control and Experimental Groups

		Posttest Writing (technology-based)	Posttest Writing (metacognitive-based)	Posttest Writing (motivational-based)
N		20	20	20
Normal Parameters[a,,b]	Mean	4.50	4.62	5.10
	Std. Deviation	1.52	1.31	1.71
Most Extreme Differences	Absolute	.182	.141	.192
	Positive	.182	.095	.192
	Negative	-.159	-.141	-.121
Kolmogorov-Smirnov Z		.751	.580	.793
Asymp. Sig. (2-tailed)		**.625**	**.890**	**.555**

As it is indicated in Table 10, the p-value for each set of scores is higher than 0.05; therefore, all sets of scores had normal distributions and the assumption of normality was satisfied. In order to investigate the assumption of homogeneity of variance, Levene's test of equality of error variances was conducted. Table 10 shows the results of this test.

Table 10: Levene's Test of Equality of Error Variances

F	df1	df2	Sig.
1.580	1	32	.218

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + Groups

The results of Levene's test of equality of error variances demonstrated that none of the variables reached a statistical significance, which means there were no values less than .05. Therefore, the assumption of homogeneity of variance is satisfied. To examine the possible interaction effect of different scaffolding groups on the writing skill pretest and posttest, tests of between-subjects' effects were inspected. The results are shown in Table 11.

Table 11: Two-way ANOVA to Compare the Pretest and Posttest Writing Scores of all Groups

Tests of Between-Subjects Effects					
Dependent Variable: Writing Test					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	141.475[a]	5	28.295	15.594	.000
Intercept	1992.675	1	1992.675	1098.211	.000
Grp	13.850	2	6.925	3.817	.025
Tests	114.075	1	114.075	62.869	.000
grp * Tests	13.550	2	6.775	3.734	.027
Error	206.850	114	1.814		
Total	2341.000	120			
Corrected Total	348.325	119			
a. R Squared = .406 (Adjusted R Squared = .380)					

As seen in Table 11, the interaction effect between the learners' pretest and posttest writing scores was significant ($F = 3.73, p < .001$). The results showed an overall statistically significant difference in the pretest and posttest writing scores of technology-based, metacognitive-based, and motivational-based scaffolding groups. Therefore, different types of scaffolding were influential in developing EFL learners' writing ability. The LSD post-hoc multiple range test was performed to detect the source of the differences. The results are shown in Table 12.

Table 12: Multiple Comparisons for Learners' Writing Ability

Multiple Comparisons						
Dependent Variable: Writing Test						
LSD						
(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Technology-based Scaffolding	Metacognitive-based Scaffolding	-.1250	.30120	.679	-.7217	.4717
	Motivational-based Scaffolding	-.7750*	.30120	.011	-1.3717	-.1783
Metacognitive-based Scaffolding	Technology-based Scaffolding	.1250	.30120	.679	-.4717	.7217
	Motivational-based Scaffolding	-.6500*	.30120	.033	-1.2467	-.0533
Motivational-based Scaffolding	Technology-based Scaffolding	.7750*	.30120	.011	.1783	1.3717
	Metacognitive-based Scaffolding	.6500*	.30120	.033	.0533	1.2467
Based on observed means. The error term is Mean Square (Error) = 1.814.						
*. The mean difference is significant at the 0.05 level.						

As Table 12 exhibits, post-hoc comparisons using the LSD test indicated that the mean score for writing in the motivational-based group was significantly different from the technology-based and metacognitive-based groups. However, the performance of the technology-based scaffolding group in writing tests was not significantly different from the metacognitive-based scaffolding group.

The qualitative analysis included the analysis of the participants' responses to a semi-structured interview. The learners were interviewed on their motivation in learning the contents of the instruction they had received. The students were asked whether they understood the most challenging material presented in this course. Forty-three (72%) interviewees responded positive, 12 (20%) responded negative, and 5 (8%) had no idea. The second question was whether they were interested in the course contents, and most of the participants (n = 54) responded positively to this question. The third question asked them about the kind

of materials that arouses their motivation in this course. They said that fun materials provided them a happy feeling, stimulating their curiosity, challenging them, complexing them, yielding good grades, they were easily understood, helping them to organize their thoughts, they were the most necessary thing for their lives, developing their ideas, achieving success, and improving their memory. The fourth question asked the interviewees about their feelings while taking the tests. Twenty-six (43%) students stated that they felt confident, 14 (23%) students felt neutral, and 20 (33%) students felt uneasy while taking tests. Finally, the fifth question asked the participants if the course contents were helpful for them. Forty-eight (80%) students said they were helpful, and 12 (20%) disagreed with this view.

5. Discussion

The present research explored the impact of motivational, metacognitive, and computational scaffolding on the writing abilities of EFL learners. The findings of the three paired sample t-tests showed a statistically significant difference in the pretest and posttest scores of all classes in such a way that learners' writing abilities were improved by using technical, metacognitive, and motivational scaffolding in the classroom. The findings showed that the motivating scaffolding community outperformed the other two classes in improving the writing skills of the EFL learners.

What is worth remembering is what happens in motivational scaffolding instruction. The learners faced new scaffolding behavior (i.e., giving guidance, presenting enlightenment, exchanging knowledge, and proposing solutions) that appeared in their classroom experiences. It is clear that learning is an innovative process, and when students have perfected their talents, they will be able to extend to other related scenarios where they can adapt what they have learned previously. Meetings with past scaffolding systems may have helped them provide scaffolding to scaffold their friends in some familiar or entirely different circumstances.

The effectiveness of the motivational form of scaffolding is the distinguishing element of the outcomes of this study. This conclusion may be understood by the sociocultural perspective as motivation may bridge

the gap between the learners' skills and those of a more knowing person; consequently, the social contacts through writing activities might assist learners to acquire higher psychological functions within ZPD. The students might collaborate with their peers and teacher to build their knowledge. The students replicated the teacher's mental processes by comprehending and using their teachers' criticism in their speech. Language learning will be more streamlined when decoding English language education utilizing scaffolding exercises. Scaffolding was beneficial to learners' writing ability because it enhanced the learning process by giving students lots of support in genuine circumstances, linking their prior knowledge with the texts, and promoting interaction among learners.

Putting SCT into practice, this research proposes combining motivational techniques and scaffolding as practical tools for mediating language learners attempting to do certain language activities. The analysis findings were more or less biased against the positive effect of integrating scaffolding components in language groups. In addition to the numbers, the fun and involved culture of the motivational scaffolding groups and their cooperation enabled them to engage more voluntarily in class discussions. They were not afraid to make errors when their friends watched their mistakes and encouraged them to ease the issues. The results of this study corroborated with those of Santoso (2010), who found that foreign language learners' writing in a hybrid-learning situation (consisting of both online and face-to-face contact) had improved. Scaffolding created an environment in which students could actively participate in writing exercises. These findings are consistent with Valencia-Vallejo et al. (2019), who showed that scaffolding promotes significant differences in metacognitive ability, academic self-efficacy, and learning achievement.

In a qualitative analysis, Cheung (2018) explored the influence of instructors' motivational techniques on student motivation in writing. Data were obtained from 344 first-year undergraduate students by classroom observation and surveys. The findings found that writing teachers' use of techniques to produce students' initial inspiration in the classroom has dramatically improved students' optimistic approach to self-confidence in writing.

The success of technology-based scaffolding is also dependent upon the structure and organization provided for language learning materials, and as a result, it makes easy the process of language learning. Technology-based scaffolding assisted learners to increase their attention, reduce anxiety, receive immediate feedback and increase their motivation. This finding is approved by Hasan (2018), who found that employment of efficient motivational scaffolding approaches is the most appropriate in current L2 scenarios for addressing the challenges of students' weak and insufficient written communication abilities. The results also confirmed Mortazavi, Jafarigohar, Rouhi, and Soleimani (2016), who demonstrated that scaffolding mechanisms significantly improved self-regulation and writing abilities.

6. Conclusion

The current study can give teachers the information on both the learners' actual level of performance and their learning potential. They can create individualized learning strategies for students with varying learning requirements. To put it another way, two pupils with the same non-dynamic but differing high and low learning potential ratings might be addressed differently. Learners with limited learning potential should be given learning and information processing tactics such as scaffolding exercises; similarly, the instructor should design various plans for each learner. The current study proved that systematically scaffolded training boosted EFL learners' writing abilities. A sufficient quantity of scaffolded instruction assisted EFL learners in doing their best and bridging gaps in their zone of proximal development.

The findings of the present study can be beneficial for language teachers to eliminate or minimize the counterproductive effects of conventional techniques and strategies on EFL learners' behavior as well as their learning. Scaffolding techniques help EFL learners enhance their learning speed, authenticity, and performance.

The study's major limitation was that the subjects in the study were not selected randomly, and a convenience sample was used. The small size of the sample groups shed doubt on the universal validity of the observed significance. A study with more participants must be replicated

to gain more reliable and generalizable outcomes. This study was conducted with two groups. To exclude the age factors, the researcher tried to study students of approximately the same age.

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