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The Impact of An Already-Proposed Problem-Based Model of Writing on Iranian EFL Learners' Writing Skill

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ABSTRACT

Objective: The present study aimed at investigating an already-proposed problem-based model of writing on Iranian EFL learners' writing skill.

Methods: In so doing, an experimental pre-test post-test control group study was designed. The participants of the study consisted of 60 female advanced EFL learners who were randomly selected from eighty-eight learners who were passing an IELTS preparation course at a private language institute. The study sample was randomly assigned into two groups (each consisting of 30 learners) namely, the experimental and the control groups. Two samples of IELTS Writing Task 2 were used for the purpose of measuring the participants' writing skill at the beginning (pre-test) and end (post-test) of the study. To analyze the data, normality test, descriptive and inferential statistics (i.e., analysis of covariance (ANCOVA) test) was used.

Results: The results of data analysis showed that the proposed problem-based model of writing affects Iranian EFL learners' writing skill.

Conclusions: The findings have pedagogical implications for EFL teachers and learners, and curriculum planners.

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Introduction

Writing is an approach to professionalism. It assists individuals in learning, investigating and communicating their findings (Gagalang, 2020; Graham & Perrin, 2007). Indeed, writing supports learning to the extent that it is a form of learning (Bangert-Drowns et al., 2004). It is used by scholars to write scientific reports and to communicate research findings. As a result, academic success of students in general and English as a Foreign Language (EFL) learners in particular is dependent on their ability to write (Alexander, 2008; Kashi et al., 2022). Accordingly, teaching EFL learners to develop their writing skill has been of importance for a long time in the education field. This is rooted in the fact that EFL learners have been shown to face challenges in academic writing which have made coping with literacy expectations difficult for them. However, the belief is that teaching writing skills can be helpful in removing academic writing challenges (Ofte, 2014). This is why the existing literature on EFL writing is replete with different teaching writing skills methods which target enhancement of learners' academic writing. In other words, research findings have led to the argument that academic writing does not occur in vacuum but it is heavily under the impact of writing skills instructions (Gagalang, 2020).

Writing, however, is a challenging skill to learn for many English as a foreign language (EFL) and English as a second language (ESL) students. It is not an inborn skill such as the speaking skill, and the students will have to endeavor to learn it. It has interactions with many different aspects of language ranging from spelling and grammar, to discourse and pragmatics (Kayaalp et al., 2022; Stevenson, 2016). In the realm of the foreign or second language learning, learning to write shows more complexity, as besides struggling to learn the writing skill, the language learners need knowledge of the second or the foreign language in terms of syntax, semantics, and discourse (Kayaalp et al., 2022; Storch, 2005).

In addition, previous research in the Iranian EFL contexts shows that many EFL learners have problems with tackling writing complexities (Amirian, 2016). Still, there is no consensus among scholars on what causes the problem. Abdollahzadeh (2010) believed that the strategies the learners use should be investigated to understand the writing problems of the EFL learners in Iran. However, according to Birjandi and Hadidi Tamjid (2012), the problem can be solved by the type of feedback given to the learners (peer vs. teacher feedback). Needless to mention that the problem

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to write is a global issue and has been observed among language learners in many different contexts (Alsmari, 2019; Ezza et al., 2019; Gagalang, 2020).

Furthermore, previous research shows that learning English in Iranian EFL context has not been very effective in terms of the writing skill (Kashi et al., 2022; Koosha & Yakhabi, 2013; Ketabi & Torabi, 2015). As writing is a cognitive task (Frear & Bitchener, 2015), one possible approach to enhance the learners' writing skill is to turn into inquiry-based approaches to learning such as problem-based learning (PBL) which have a high cognitive demand and usually result in high retention of knowledge (Hmelo-Silver, 2004). Theoretical assumptions of PBL, which is an interdisciplinary and collaborative approach to leaning (Hayashi et al., 2013) show its focus on practical aspects of knowledge rather than theoretical accumulation of knowledge. Given that writing is a productive language skill which manifest the authors' skill in practicum, PBL may be of effectiveness in solving EFL learners' writing challenges and problems.

PBL, as stated by Johnson and Johnson (2009), is a form of collaborative learning that is replete with discussions and negotiations, while group dynamics such as cooperation and mutual engagement also occur in classes. In addition, a number of studies by Deane et al. (2008), and Martínez-Fernández et al. (2016) support the positive effect of making use of students' cognition in writing instruction and assessment. In the same vein, PBL provides the students with the opportunity to truly use their cognitive and metacognitive abilities, as problem-solving is the most dominant skill used by the students in PBL approach (Savery, 2006).

These issues, coupled with the researchers' interest in PBL, served as a motivation for the researchers to conduct the present study to investigate the effect of a model for implementation of PBL in writing classes already developed by them in a recent study (Kashi et al., 2022) on Iranian EFL learners' writing skill.

Literature Review

Theoretical Framework

Three theories in education underpin the use of problem-based learning in education. These theories were taken into account by scholars in the field of problem-based learning to design PBL models. These theories, i.e., experiential learning theory, higher order thinking and collaborative learning based on Zone of Proximal Development (ZPD) are explained in this section.

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Experiential learning or learning through gaining hands-on experience, is one of the most ancient forms of learning which was renewed in the 20th century by Dewey (1938, as cited in Hmelo-silver, 2004). Experiential learning is also one of the bases of inquiry-based approaches to learning. Although in the past, experiential learning meant learning a raft from a master by observing him and mimicking his actions, recent forms of experiential learning are more complicated. Therefore, there are known to be more scientific. Firstly, collaboration has been added to learning through the experience, as most learning in recent times occurs in groups. Secondly, modeling an act is believed to guide the learners through lower order thinking; thus, the learners are asked to explore and find the solution to their learning problems on their own. Robert (2003), however, notes that education without experience is useless and unless the learners feel the learning content, they cannot be successful.

Although the concept of experiential learning was presented by Dewey (1938, as cited in Hmelo-silver, 2004) with clear boundaries between concepts, new findings in the field of psychology and education urged the need to have a more meticulous look at the issue. One of the concepts in this regard was 'higher order thinking'.

Bloom's cognitive model identifies levels of cognitive development in learning and has been the underlying assumption of PBL (Larsson, 2001), and many language learning hypotheses such as involvement-load hypothesis by Hulstjin and Laufer, (2001). Although the model was criticized for being sequential and artificially constructed, it looks very well at learning so much so that it is still being considered as the basis of inquiry-based approaches to learning (Savery, 2006). The model aids the researcher to utilize higher thinking skills of the learners. In order to conduct a more accurate study, the researcher made use of Anderson and Krathwohi (2001) cognitive model which is the revised version of Bloom's cognitive model. In Bloom's tradition, successful learning begins by reading concepts in the minds of the learners so that the learners can evaluate the concepts, decode them and finally analyze them. As a result of this analysis, they find solutions to the learning problems and apply them to make sure these solutions have effects. This can lead to understand and remembering is the final product of a higher order thinking process.

Collaboration is one of the distinctive features of problem-based learning. The notion of collaboration comes from the social constructivist view of Vygotsky (1987) who unlike Piaget

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believed that society and context play a significant role in learning. The role of the learners was not only to consider what he/she knows, but also to explore what peers and learners know.

The proposed model

The proposed problem-based model for writing is illustrated in Figure 1.

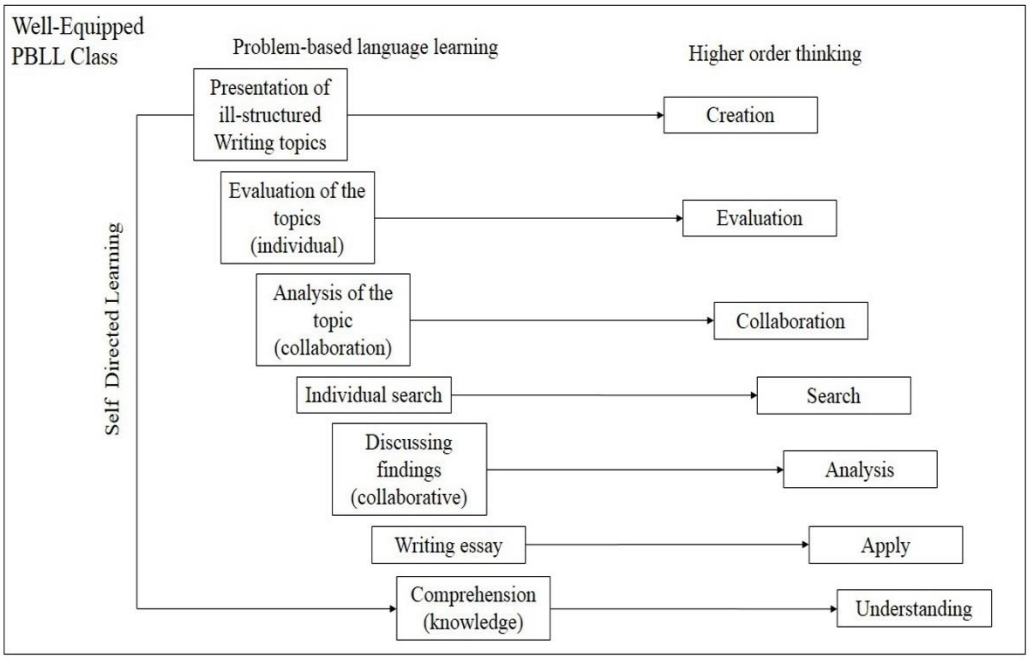


Figure 1. The Problem-based Model for Writing

In explaining the model, the column on the left side of the model shows the pedagogical steps in a problem-based writing class and the column on the right show the corresponding steps based on higher order thinking theory. As 'suitable technology' was one of the themes extracted from the respondents' speech, the problem-based writing class was entitled ' well-equipped problem-based language learning class'. The respondents also noted that the ill-structured problems were engaging and at their level. Thus, based on this theme and in line with the overall PBL methodology, Presentation of the ill-structured problem was suggested as the first step in the learning process. This is the only step which is expected from the course tutor to accomplish and is in line with the step 'creation' in higher order thinking model. The second row of the column was entitled 'evaluation of the topic (individual)'. The student-respondents stated that Problem-based topics require more thinking and are different from the ordinary topics. It was also stated by the teacher-respondents that learning through problem-based learning is similar to real-life learning. Real-life

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issues require thinking and evaluation. This step corresponds to the second step in higher order thinking, i.e., evaluation. After, the students analyze the ill-structured topics, they should discuss the topic collaboratively. Through this discussion, they identify what they know and what they need to know. This is in line with the ZPD theory by Vygotsky (1987) and was stated by the teacher-respondents where they posited that PROBLEM-BASED LEARNING is an analytical approach rather than an imitative one. The student-respondents also mentioned that they learn from the classmates rather than the teacher and have more learning chances. They also pointed to sharing useful information as a significant learning tool. Therefore, this step was added to the model. This step is in congruence with ZPD theory which emphasizes learning from others. 'Individual search' was suggested as the next pedagogic step in problem-based model for writing. Search was emphasized by both teacher-respondents and the student-respondents as a significant learning tool. Student-respondents stated that sufficient equipment are required for conducting online search. In addition, they pointed to suitable type of technology, and internet connection. The teacher-respondents also posited that the learners should use English to search, thus English is a tool and objective. This increases the learners' chances for learning. The next pedagogical step mentioned in the problem-based model for writing is 'discussing findings (collaboratively)'. Discussing findings and deciding on how to write the essay is among the important steps, as many of the themes in the students' respondents and teacher-respondents' speech referred to this theme. The student-respondents referred to 'easier collaboration', 'learning from groupmates vs. the teacher', and 'joyful learning'. Similar perceptions with associations with collaborative learning were also mentioned by the teacher-respondents. Discussing findings is in line with analysis step in the problem-based model. The students finally put their efforts in a practical form. Thus, writing the essay comes at the end of the learning model. Through this step, the learners decide on what information should be included in the essay. This step is in line with the level 'apply' in higher order thinking model. This form of learning should lead to comprehension (knowledge) and is a self-directed approach to learning (Kashi et al., 2022).

Empirical Studies

Elizabeth and Zulida (2012) conducted a study in the context of Malaysia and investigated the use of PBL in ESP courses using 25 participants. They reported that problem-based learning has effects of linguistic and affective factors of the learners and is one of the approaches that can consider

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language learners as 'whole person'. In the same year, Huang and San (2012) delved into the impact of PBL on participants' conception, enjoyment and motivation in L2 classes. By using 42 participants in Taiwan, and / a diagnostic reading tests along with an interview they concluded that that PBL has positive effects on learners' conception and enjoyment.

Sy et al. (2013) focused on the effect of PBL on EFL learners' speaking skills. They made use of 49 participants who were asked to describe places, people and objects before and after a problem-based learning course. They concluded that problem-based learning can positively affect the participants' skill in describing these phenomena.

In another study, Othman and Shah (2013) attempted to see the effect of PBL on content of course and language achievement of 128 Malaysia students in a writing course. They made use of a pre-writing test and a post-writing test. Although they realized that course content is not affected by PBL, they saw a positive effect of PBL on language achievement. Similarly, Coffin (2013) endeavored to see how PBL affects L2 writing. He selected 182 students and 3 teachers in Thailand. The results showed that PBL is effective on L2 writing by enhancing learners' criticality and autonomy.

Lin (2017) measured the effects of PBL on reading comprehension through a web- based English course of 60 Taiwanese students. A reading test, and an instructional questionnaire were used in a mixed-methods study. The findings revealed that the participants' reading comprehension significantly improved under the effect of PBL.

Aliyu (2017) worked on writing and metacognition. He benefited from 18 Nigerian undergraduate learners and adopted a PBL questionnaire from Tan (2004) on metacognitive thinking. He found out that PBL has a significant impact on writing and metacognition of EFL learners in Nigeria. Fonseca- Martínez (2017) studied the effects of PBL in a basic-level language class. The focus of her study was on talking time. Using 47 students in Peru. It was found that PBL can positively affect language learners' talking-time.

In another study, Mohammadi (2017) delved into vocabulary learning by 60 Iranian EFL leaners in a pretest and posttest experimental design and found that PBL can significantly influence both recall and retention of vocabulary. One of the considerations in conducting this study was to only focus on the vocabulary items that were unknown to the participants.

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Ansarian, et al. (2016) aimed at investigating to see the effects of problem-based learning on speaking Proficiency of 95 Iran IELTS test takers. Using a quasi-experimental design and by taking IELTS speaking test part 2 and 3 as pretest and posttest, it was revealed that problem-based learning has a positive effect on pronunciation, vocabulary learning and use of grammatical structures among EFL English speakers. In the same year, Bejarano, et al. (2016) tried to see the impact of problem-based learning on vocabulary learning of 20 Colombian students using an observation field notes. The findings of this mixed-methods study revealed that both social values and vocabulary items can be taught using problem-based learning.

Ansarian and Teoh (2018) authored a book on problem-based learning and attempted to present a problem-based learning model to be used in language classes. In their opinion, a PBL model should be different from a problem-based learning model by considering the intricacies of learning a new language. Thus, they believed previous models, which were in many respects practical, do not suffice for language classes. One year later, Ansarian (2019) presented a comprehensive model of problem-based learning and claimed that the model can be used in language classes; especially with regards to the speaking skill. The model was based on Hmelo-Silver's (2004) and Hung's (2006) PBL model.

Reviewing the existing literature, the researchers found that missing in the literature is an empirical study on the effectiveness of a problem-based model of writing on Iranian EFL learners' writing skill. To bridge this gap, the following research question was formulated:

1. Does the proposed problem-based model of writing affect Iranian EFL learners' writing skill?

Material and Methods

Design and Context of the Study

This study, in line with its stated objective, benefited from an experimental pre-test post-test control group design. An already proposed problem-based model of writing served as the independent variable, and writing skill was the dependent variable of the study. No random sampling was present in this study and this is why it is quasi-experimental. In this type of design, the experimental and control groups are exposed to different kinds of treatments. However, both groups participate in the same pre-test and post-test. The context of the study included a private language institute in Tehran, Iran.

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Participants

Eighty-eight females advanced EFL learners who were passing an IELTS preparation course at a private language institute were considered as the target population. They had not passed any training course on PBL. From the population, 60 learners were randomly selected as the main sample of the study and randomly assigned into two groups (each consisting of 30 learners) namely, the experimental and the control groups. The two groups were not exposed to any training than the treatment program of the present study during the study. Their mean age was 26. Their native language was Persian. Ethical considerations were observed in selecting the participants by making them ensured about anonymity and confidentiality of their personal information and taking their consent for participation in the study. Further, they were fully informed of the objectives of the study.

Instruments

Two Samples of IELTS Writing Task 2: Two samples of IELTS Writing Task 2 were used for the purpose of measuring the participants' writing skill at the beginning (pre-test) and end (post-test) of the study. In the pre-test, the participants were required to write 250 words on the following topic: 'Children are influenced by their friend's opinions. In what ways are children affected by their friends? How can parents make sure this influence is positive?' The inter-rater reliability of the test was calculated as .90. In the post-test, the participants were asked to write 250 words on this topic: 'The government should ban smoking in all public places, even though this would restrict some other people' s freedom. Do you agree or disagree? Give reasons for your answer.' Both tests were scored using IELTS Task 2 writing band descriptors in a scoring range from 0 to 9. The inter-rater reliability of the post-test was calculated as .86.

Data Collection Procedure

To collect the data, first, sampling was done through simple random sampling, observing ethical issues, followed by assigning the participants into two groups, namely the experimental and control groups. Then, the participants' writing skill was measured in the pre-test by a Sample IELTS Writing Task 2. Next, the treatment period of the study started wherein the participants were exposed to 12 60-minute writing skill sessions twice a week. During the sessions, the researcher as an IELTS instructor taught both groups writing skill. The only difference between the two

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groups was that while the experimental group benefited from writing instruction based on the proposed problem-based model of writing, the control group was taught through traditional writing instruction based on the principles of paragraph writing. To be more specific, in teaching writing to the experimental group, the teacher took advantage of the pedagogical steps of the proposed PROBLEM-BASED LEARNING model of writing: Presentation of ill-structured writing topics, evaluation of the topics, analysis of the topic, individual search, discussing findings and writing essay. But in the control group, the teacher taught writing to the students according to the principles of paragraph writing covered in the Paragraph Development book by Arnaudet and Barrett (1997). One week after the end of the treatment period, the participants' writing skill was measured in the post-test by a Sample IELTS Writing Task 2. To check inter-rater reliability of the pre-test and post-test, a colleague who was an IELTS instructor was asked to rate the pre-test and post-test as the second rater.

Data Analysis Procedure

To analyze the data, normality test, descriptive and inferential statistics (i.e., analysis of covariance (ANCOVA) test) was used.

Results

This section provides the results of normality test of pre-test and post-test data in Table 1.

Table 1. Results of Normality Test of Pre-test and Post-test Data

Indices	Writing (pre-test)	Writing (post-test)
N	60	60
Test Statistic	0. 87	0.140
Asymp. Sig. (2-tailed)	0.26	0.40

As shown in Table 1, the distribution of data was normal in the pre-test and post-test. Table 2 shows the results of descriptive statistics for the experimental and control groups.

Table 2. Results of Descriptive Statistics for the Experimental and Control Groups

Group	Writing	N	Min.	Max.	Mean	SD
Experimental	Pre-test	30	0.00	4.50	2.30	3.16
	Post-test	30	1.00	8.00	6.33	2.10
Control	Pre-test	30	0.00	3.00	1.00	3.66
	Post-test	30	0.00	4.00	2.50	2.80

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As indicated in Table 2, the pre-test mean of writing skill of the experimental group was 2.30, and standard deviation was 3.16. The mean and standard deviation values of the same group in the writing post-test were 6.33 and 2.10, respectively. In the control group, the pre-test mean of writing skill was 1.00, and standard deviation was 3.66. The mean and standard deviation values of the control group in the writing post-test were 2.50 and 2.80, respectively.

To see whether the proposed problem-based model of writing affects Iranian EFL learners' writing skill, the pre-test and post-test mean writing scores of the experimental and control groups were compared with each other running an ANCOVA test. Before running the analysis, it was necessary to examine the assumptions of equality of variance. Table 3 shows the results of the Levene's test.

Table 3. Results of Levene's test of equality of error variances

F	DF1	DF2	Sig.
0.59	1	58	0.45

As can be seen in the Table 3, the assumption of equality of variance is met. The results of the ANCOVA test are shown in the Table 4:

Table 4. Results of ANCOVA

Source of variance	Type III Sum of Squares	DF	Mean Square	F	Sig.	Effect Size
Pre-test	2746.39	1	2746.39	50.91	0.000	0.50
group	4301.51	1	4301.51	79.74	0.000	
error	171.41	1	171.41	73.18	0.000	
Total	3075.01	57	53.95			

The results shown in the Table 4 indicate that the differential effect of treatment (i.e., the proposed problem-based model of writing) on the posttest writing scores of the participants was significant ($F= 73.18$, $p<.05$, effect size= .50) under the condition of eliminating the effects of the covariate (i.e., the pretest writing scores). This shows that the proposed problem-based model of writing affects Iranian EFL learners' writing skill.

Discussion

The results of data analysis showed that the proposed problem-based model of writing affects Iranian EFL learners' writing skill.

The researchers found no study on the effectiveness of a problem-based model of writing on Iranian EFL learners' writing skill in the existing literature; however, the effect of the problem-

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based learning on different aspects of EFL learning has been proved in some previous studies. For instance, in the studies by Ansarian, et al. (2016) and Fonseca- Martínez (2017) on the effect of problem-based learning on speaking proficiency, speaking of EFL learners was found to be under the significant impact of the problem-based learning. Moreover, in the studies by Bejarano, et al. (2016) and Mohammadi (2017), it was revealed that vocabulary learning of Iranian EFL leaners was significantly impacted by the problem-based learning. Similarly, in the study by Kadhim (2019), the influence of the problem-based learning on EFL learners' English achievement was shown.

In justifying the findings, it can be mentioned that potentially engagement as core concept in problem-based learning has led to significant improvements in writing skill of the EFL learners (Teoh et al., 2019). Moreover, self-direction encouraged in problem-based instruction may have mediated the effect of the proposed problem-based model of writing on EFL learners' writing skill (Andujar et al., 2020). Additionally, since in problem-based learning, the learning content is linked to the students' real-life, it contributes to deeper learning. This in turn may lead to remarkable improvements in writing skill of the EFL learners (Kassem, 2018).

Furthermore, it can be argued that creativity and higher order thinking which are products of problem-based learning have the potential to make EFL learners better English writers by giving them self-evaluation power (Butler et al., 2020; Tan, 2021). The other mediating variable in the effectiveness of the proposed problem-based model of writing on Iranian EFL learners' writing skill is critical thinking the significant role of which in EFL writing has been enumerated in previous studies (e.g., Adamura, 2021; Handoyo, Rosbiono & Sopandi, 2021). In addition, the positive impact of the proposed problem-based model of writing on Iranian EFL learners' writing skill may be attributed, at least partially, to the positive effect of the problem-based learning on the EFL learners' vocabulary learning as evidenced by Mohammadi (2017). Besides, motivation generated in the learners as a consequence of being exposed to the problem-based learning (Kadhim, 2019) may have played a mediating role in the influence of the proposed problem-based model of writing on Iranian EFL learners' writing skill. Last but not least, as a result of collaboration as one of the main pillars in problem-based learning, the EFL learners can better transfer meaning and experience and this in turn can contribute to writing growth and efficiency among them (Shimizu et al., 2021).

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Conclusion

The findings of the present study showed that the proposed problem-based model of writing impacts Iranian EFL learners' writing skill. Accordingly, it can be concluded that the model designed in this study can be used by EFL teachers to enhance the English writing skill of the learners. Moreover, it can be concluded that the proposed model the proposed model can be used by EFL learners as a self-study program in an attempt to improve their English writing skill, since the problem-based learning, as a learner-centered approach, is not dependent on EFL teachers. Besides, this conclusion can be made that EFL curriculum planners can develop future EFL curricula in a way that the components of the proposed model be used in the form of various writing tasks or activities. In this way, it can be expected that EFL learners learn practical writing by being more engaged and self-directed in the learning process and provided with more chance and time to practice the writing skill. This study just focused on the use of PBL in writing classes. Future research is recommended to deal with other productive as well as receptive EFL skills. Further, given that the treatment period of this study was relatively short, the future studied can replicate this study with an extended treatment time. Additionally, this study was just concerned with the short-term effect of PBL on writing skill. It is suggested to tackle the long-term effect of PBL on writing and other EFL skills. Last but not least, exploration of the perceptions of EFL teachers and learners of the proposed problem-based model of writing may add to the validity of the findings of the present study.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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