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Fostering EFL Learners' Writing Competence through Problem-Based Learning

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ABSTRACT

Problem-based learning approach's popularity has grown tremendously in Academic Writing courses throughout the world. The rationale for this rise is that students are driven to pinpoint problematic situations, brainstorm, and find a lasting solution collaboratively, thereby sharpening 21st-century skills, such as writing literacy, problem solving, and critical thinking. Although a growing number of studies are prevalent on this promising approach globally, a gap in the literature has been noticed about its influence on increasing university students' writing competence in Iraq. To this aim, this mixed method research design study was conducted on 50 freshman students at a private university in the even semester of the 2023–2024 academic year via cluster sampling method spanning 12 weeks. Control group students carried out their writing education as in the curriculum; however, experimental group students' writing lessons were enriched with the principles of problem-based learning. Having analyzed the data by SPSS 29 and MAXQDA, fetched by writing exams and surveys, findings revealed that experimental group students outperformed control group students regarding enhanced writing performance, boosted motivation, and improved critical thinking with statistically proven data by adopting the distinguishing qualities of problem-based learning at the tertiary level in Iraq context. In other words, the post-test writing exam culminated in a 0.003 statistically significant p-value based on the t-test. Complementary surveys also unearthed a positive correlation between employing problem-based writing instruction and increasing motivation as well as critical thinking skills. The findings of this study may have certain implications for stakeholders who have sought ways to integrate problem-based learning into tasks in Academic Writing courses through a well-established plan and meticulously monitored writing process on a global scale.

Keywords: Academic writing; Critical thinking; Problem-based learning; Problem solving

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1. Introduction

Languages play pivotal roles in easing communication globally. Although there are numerous languages in the world, English stands out from others with its distinctive positions in a wide range of fields because English has been considered the most widely spoken language in the world with 1.5 billion speakers, succeeded by Mandarin and Hindi (Bilgin, 2024; Børte, Nesje, and Lillejord, 2023; Celik, 2023). Some reasons are elucidated to justify the dominance of English in the global arena. To name a few, English is the official language in approximately 70 countries out of 206, according to the UN figures, thereby keeping its reign in economic, social, professional, and academic life. Besides, English is the working language in fact in certain countries, such as Qatar and the United Arab Emirates; therefore, job seekers have no choice but to sharpen their English skills to find stable jobs in those countries (Fard and Vakili, 2018; Kurudirek and Berdieva, 2024; Yucedal and Shareef, 2022). Additionally, English is the common language in tourism, thereby removing the barriers to communication significantly among the members of different countries. Moreover, English dominates websites overwhelmingly accounting for 60%, so it unlocks the doors on the way to being a global citizen by satisfying the quench for novel information through web sources continuously. More specifically, various online means can be accessed instantly, including banking, trade, shopping, publication, game, and audio-visual tools. Thus, the systems work flawlessly to conduct transactions, expand the scope of business initiatives, do online shopping, read many sources, play games, and watch countless materials (Kara and Yildiz, 2022; Lee, 2022). Apart from other fields, the influence of English is stark in education because more emphasis has been given to English classes, from basic education at kindergarten to higher education at universities, as educational institutions design their programs to bridge the gap between academic and professional life. Correspondingly, standardized English exams, such as TOEFL, IELTS, and PTE have increased their popularity exponentially because language learners are ambitious to prove their credentials and reap several benefits at different stages of their lives. It is safe to conclude that

English taps the unfulfilled potential of the learners through countless opportunities in multiple settings.

Writing skills are crucial in life to meet the needs of the 21st century personally and professionally. To illustrate, writing is the foundation skill that lays the background for other skills, such as reading, listening, and speaking (Abubakr Abdulrahman and Kara, 2022; Artayasa et al., 2018). Additionally, writing appropriate responses to the queries in the exams is fundamental to assessing learners' abilities through summative and formative assessments. Moreover, the chat features of social media applications urge users to express their ideas convincingly and convey their meaning successfully. After that, writing regularly can enhance learners' imagination, creativity, and problem-solving skills because each writing attempt entails a positive cycle of thinking, composing ideas, and coming to the right decisions (Fajriah, 2023; Kara and Abdulrahman, 2022). In the same vein, refined writing skills are a prerequisite for many job interviews. To name a few, writing prompts are accompanied by oral questions to find the best candidates for a vacant position at workplaces. Besides, writing is essential for sending e-mail, an irreplaceable part of professional life in the information age for various reasons. In addition, forming a presentation, composing a report, and creating plans for the betterment of the companies necessitate using writing skills wisely. Overall, writing skills are key to career development and personal improvement.

Academic Writing courses have received increasing attention at educational institutions to equip learners with sufficient knowledge of academic writing so that they can proceed gradually and succeed ultimately. Three prominent approaches, namely product, process, and genre, have come to the forefront to cover academic writing courses in a welcoming atmosphere professionally. The product approach has been characterized by analyzing the model writing task thoroughly and composing a novel writing work at the end (Yucedal, Abdulrahman, and Kara, 2022). It is also known as a guided writing activity because learners become independent step by step. The product approach suggests that the learners brainstorm, discuss, elaborate, and finalize their

ideas in a refined form. On the other hand, the process approach encourages the learners to brainstorm cooperatively, form several drafts, and edit based on the feedback before the submission, so the writing process is a cycle of exchanging ideas and eliminating the weak points before the submission (Menggo and Gunas, 2022; Strobel and Van Barneveld, 2009). It can be argued that the teacher-centered mode has been reduced to leave room for the student-centered method in the process approach. The latest trend in teaching writing more effectively is the genre approach which is designed to enhance students' writing competence through different genres, such as reports, biographies, essays, and theses. It goes hand in hand with English for specific purposes, so learners can find a lot of common points between the adopted instruction and their social lives. For example, they are required to write a report about their projects, compose their ideas in a written form for internationally recognized exams, and submit their theses to earn a master's degree. They also learn how to comprehend details in the specific genre via model writing works and replicate them correspondingly so that they can be unique, creative, and appealing to the readers (Kornhaber et al., 2016). As it is evident, defining the problem and taking rational action are at the center of each writing approach. Thus, possible hindrances can be tackled easily in the way of writing flawlessly.

Problem-based learning (PBL hereafter) has gained increasing popularity and appreciation from all fields thanks to its far-fetched positive effects in academic, social, and professional life. Its motto is to trigger people's creativity in the discussion mode through well-balanced brainstorming activities thereby tackling real-world problems (Dita, Utomo, and Sekar, 2021). In other words, individuals negotiate to combat chronic problems and offer practical solutions that will be the lasting remedy. To illustrate, students can define the most pressing issues of the 21st century and set the framework to eliminate them gradually by urging the citizens in the community to behave more responsibly. More specifically, students can spark the curiosity to highlight certain problems

and devise logical strategies to solve them in common sense. Similarly, responsible community members can organize fruitful meetings to emphasize major challenges and apply the most rational ideas to resolve them (Puspita, 2023). Likewise, co-workers can uncover constructive feedback for the betterment of the company at the workplace. As it is evident, PBL is at the center of a growing number of fields as it values freedom of speech and guides individuals to decide collaboratively. Likewise, integrating a PBL-enriched education into an Academic Writing course can equip the students with the necessary skills to handle any difficulties in life by employing pre-requisites of 21st-century competencies including writing literacy harmoniously. Thus, they reap the benefits of PBL not only in writing classes but also in other fields where merging skills are needed to show considerable progress.

1.1 Significance of the study

Implementation of PBL has been observed as a fruitful attempt at educational settings in many courses, including English (Abdullah et al., 2022; Affandi and Sukyadi, 2016; Bulqiyah, Mahbub, and Nugraheni, 2021). Although a paucity of research has been conducted to gauge the role of PBL in elevating students' performance, a considerable gap has been noticed in the Iraq context to measure the effectiveness of PBL in Academic Writing classes at the tertiary level. Moreover, this study is undertaken to make valuable contributions to Academic Writing curriculums around the world by employing an interdisciplinary approach. More specifically, severe problems that have affected the whole universe have been emphasized with the causes, solutions, and practical action plans. Thus, conventional curriculums in Academic Writing courses have been expanded with real-life problems to boost students' motivation to increase their engagement. Additionally, this study paves the way for putting the principles of Content-Based Instruction (CBI hereafter) into EFL classes successfully because the problems of the 21st century can be related to math, science, physics, biology, and chemistry as pointed out by Dita,

Utomo, and Sekar (2021). As it is stark, the current study has multiple significances in terms of writing expansion, interdisciplinary connections, and sharpening certain fundamental 21st-century skills.

1.2 Problem of the study and research questions

Having analyzed studies of (Abbas and Shaymaa Abdulbaqi Al-bakri, 2018; Majeed and Ali, 2018; Mohammed, Al-Mofti, and Hussein, 2020; Puspita, 2023) on Academic Writing courses, it has been uncovered that several minor barriers are prevalent in Academic Writing classes at the tertiary level in Iraq; however, they can be tackled easily with a well-established plan if stakeholders negotiate and devise lasting solutions. To name a few, some students are reluctant to articulate their ideas in the pre-writing period, so they miss brainstorming to have the background information for the topic or exchange their ideas with their peers as cited by Yucedal, Abdulrahman, and Kara (2022). Subsequently, nearly half of the students could not have a chance to improve their writing skills due to prioritizing other skills or courses for local standardized tests to be admitted to the university, most of which omit the writing section. Furthermore, a growing number of students have asserted that there is a huge gap between their real life and topics in writing classes, so their enthusiasm toward writing compositions fades gradually (Algburi and Razali, 2022; Yildiz, 2020). After that, a considerable number of students are not adapted to thinking about the target language; rather, they spend time translating from their mother tongue into the target language (Nasser, 2018). Thus, they are not able to complete writing tasks on time. They mostly submit the writing tasks in an incomplete format. Last but not least, many students have underlined that they succumb to stress and anxiety while composing their ideas, thereby reducing their writing grades dramatically. Considering the aforementioned concerns, it is unambiguous that there is a need to make profound changes in Academic Writing courses to capture students' attention and increase their attention span in the Iraq context. In this regard, employing PBL is recognized as a game changer to transform their

writing performance and motivation, thereby breaking the monotonous negative cycle in Academic Writing settings. Correspondingly, this study seeks to address the following research questions:

- How effective is PBL to improve students' writing performance in Academic Writing courses?
- What is the influence of PBL in boosting students' motivation in Academic Writing courses?
- What is the role of PBL in sharpening students' critical thinking skills?

2. Literature review

Problem-Based Learning is a total approach to education that fosters students' learning in an active learning process through exploration, collaboration, negotiation, and production. The history of PBL dates back to the 1960s by two American professors of medicine, Howard Barrows and Robyn Tamblyn, at McMaster University Medical School (Ontario, Canada) to successfully apply theoretical knowledge to clinical problems. Since then, its application has spanned many fields, including linguistics, due to its promising role in bridging the gap between theory and practice. Some scholars (Kemaloglu and Sahin, 2022; Kurt and Beck, 2023; Menggo and Gunas, 2022) have argued that PBL offers numerous benefits in English language learning settings; whereas others (Arani, Zarei, and Sarani, 2023; Borte, Nesje, and Lillejord, 2023) asserted that PBL has various drawbacks that demotivate English learners. To name a few, Yew and Goh (2016) posit that PBL derives from constructivism, thereby encouraging the learners to shape their learning through hands-on experimentation. Similarly, Samosir et al. (2023) attest that PBL drives learners to exchange their ideas independently, get feedback from their peers, and seek further until they satisfy their curiosity. Additionally, Lee (2022) points out that problem-based learning stimulates students' creativity in English classes because their motivation is channeled into defining real-world problems, contemplating possible solutions, and prioritizing the most viable way to eliminate problems in cooperation. Besides, Palubi and Subi-

yantoro (2020) elucidate that PBL is a multi-faceted approach that enhances students' performance significantly via workshops, debates, projects, reports, and journals. It can be inferred that PBL appeals to different learning styles through various activities so that students' engagement can increase correspondingly. Furthermore, İpek, Gözümlü, and Papadakis (2023) put forward that PBL urges students to take advantage of technological means so that they can expand their knowledge to be more creative in their expressions through written and oral tasks. On the other hand, each approach has its critics who underline some drawbacks, although their figures are far less than proponents. For example, Artayasa et al. (2018) assert that PBL is not a useful approach at all levels because students need to pass certain stages to be able to activate their critical thinking and problem-solving skills. More specifically, they argue that maturity matters in reaping the benefits of PBL; otherwise, the disadvantages of PBL outweigh the advantages. Additionally, Nunaki et al. (2019) point out that conducting PBL in EFL classes can be a burden in some cases because it requires much time to define the problem, brainstorm, and choose the best alternative to eliminate the problem. They also elucidate that some teachers lag the curriculum due to allocating much time for PBL rather than following the prerequisites of the course to be assessed periodically by the educational institutions. Furthermore, Kucuk (2023) attests that PBL urges the learners to improve higher-order thinking skills, primarily critical thinking through identifying, analyzing, synthesizing, and solving problems; however, some students feel desperate, and succumb to stress and anxiety once they cannot sharpen their critical thinking skills during activities.

A growing number of studies have been conducted to measure the effects of PBL in English classes, where adopting the cycle to define and resolve the problem was observed as a fruitful attempt though a limited number of studies could not pinpoint a positive relationship between employing PBL and having some gains linguistically. To name a few, it was found in the Taiwan context by Lin (2017) that PBL

fostered university students' reading comprehension and equipped them with active learning strategies. Thus, they could remain ahead of the control group students in terms of weighing certain points of the problem critically and taking action to solve it. Another noteworthy study was conducted by Fard and Vakili (2018) on Iranian students who took intensive English courses at an institute where students' listening, and vocabulary skills were enhanced dramatically upon having taken courses based on the principles of PBL. The participants reiterated that PBL drove them to research and broaden their perspectives because they not only read but also watched or listened to a considerable amount of audio-visual content. Additionally, Ng (2017) substantiated that PBL affected university students' academic writing skills positively in Singapore as real-life problems increased students' engagement and motivation to do research thoroughly and find a lasting solution to chronic issues in a written format. In the same vein, Ghufroon and Ermawati's (2018) study on Indonesian university students showed that PBL increased students' responsibility to learn more and apply the knowledge in their writing tasks which were related to narrative, expository, descriptive, and persuasive essays. Similarly, Dawilai, Kamyod, and Prasad (2021) examined the effectiveness of PBL on Thai EFL learners which displayed that it drove the learners to enrich their learning from a wide variety of fields, so students' creativity was stimulated in writing activities. Align with other studies, Yew and Goh (2016) conceded that PBL had tremendous roles in improving students' levels of speaking on students in Australia at the tertiary level. Subsequently, Sutarto, Dwi Hastuti, and Fuster-Guillén (2022) conducted a study in Indonesia revealing that PBL paves the way for metacognitive scaffolding, thereby ensuring new insights, knowledge, and skills.

However, some studies did not yield positive results upon having employed a PBL-based approach in English classes. For example, Fajriah (2023) stated that PBL posed some problems because it was challenging to train the teachers and motivate them to run PBL-based instruction in Indonesia on

university students. Furthermore, Lin (2017) concluded that employing problem-based learning did not generate satisfactory results unless it was merged with project-based learning in the Taiwan context on primary students. Moreover, Affandi and Sukyadi (2016) conducted a meta-analysis whose findings revealed that the PBL approach fails to meet the needs of educators in terms of long-term retention and skill development, contrary to a growing number of previous studies. Similarly, Montafej, Lotfi, and Chalak (2021) underlined that employing PBL purely is not sufficient to get the highest benefit; rather, it should be accompanied by a hybrid PBL, which includes further activities to engage students fully in the Iran context. Considering previous studies, it is safe to conclude that PBL is a promising approach to foster students' learning infinitely albeit having some minor obstacles to be considered so that its effectiveness can be raised significantly.

3. Methodology

3.1 Research design

A mixed-method research design was adopted in this study since the researchers gathered the required data through surveys and written exams. More specifically, questionnaires and interviews were held to gather quantitative data, whereas several exams were held to pinpoint differences in terms of writing in the form of pre-test and post-test. In other words, the questionnaires and interviews were inserted into the study to gauge students' attitudes, while written exams were engaged in the study to gauge students' learning rates. McKim (2017) pointed out that a mixed method research design has been used in social science studies increasingly thanks to its overt advantages while complementing numerical data with verbal ones flawlessly. Meanwhile, it is of greatest importance that quantitative data were triangulated with qualitative data to determine the effect of PBL on students' writing performance more accurately and reliably. In order to realize triangulation, both data were collected and analyzed individually in the first phase. When individual analysis was

completed, they were compared, integrated, and interpreted in the eye of all types of data. As noted by Gibson (2017), triangulation refines the research by removing biases so that the validity and credibility of the studies can be enhanced substantially.

3.2 Sample selection

This study was carried out at a private university located in Erbil, Iraq. The participants were selected via cluster sampling among the students who enrolled in the Foundation English course during the 2023–2024 Academic Year. Fifty students, 22 male and 28 female, were picked from the population, and their ages ranged from 17 to 24. The Foundation English course has been offered for students whose levels are not as satisfactory as others based on the proficiency exam results conducted by the university. Proficiency exam questions are a combination of Cambridge and Oxford Proficiency Exam materials including all macro and micro skills harmoniously. However, ELT experts scanned all questions thoroughly and refined the exams to measure students' levels successfully. Of particular note is that students' high school curriculum was also examined to add some questions to the proficiency exam so that they could find some common points between the proficiency exam and the high school curriculum regarding English subjects. All students who were placed in the Foundation English category were grouped according to their departments. Next, two students were chosen from each department randomly with the help of a software called Random Team Generator to represent either the control or experimental group, respectively. Berndt (2020) stresses that cluster sampling is a feasible non-probable sampling method because it grants flexibility to the researcher to focus on the clusters rather than the entire population so that time, money, and effort are expensed in a balanced way. Once they were divided into categories, the lessons were shot based on the principles of the Communicative Language Teaching (CLT hereafter) method under the supervision of dynamic and qualified ELT lecturers as 10 hours per week through the renowned Cambridge OWN IT 2

coursebook series.

3.3 Instruments and procedures

Several instruments were used to place participants homogeneously, measure the statistical differences accurately, and gauge students' attitudes toward PBL reliably by the researchers. To illustrate, the Cambridge English Placement Test was applied to determine their current level and balance the classes in terms of average scores. The exam is chosen on purpose because it encompasses reading, listening, grammar, and vocabulary sections. Additionally, it serves all students aged 12 and above. In addition, it submits an easily understandable report to see the strengths and weaknesses of the students instantly. As communicative competence is at the heart of the assessment process, the speaking section was also included in the test. When the exam was ready, the questions were piloted on some students whose levels were supposed to be the same as the participants. The pilot study was finalized with a 0.94 Cronbach Alpha Index which was more than adequate to meet the internal consistency criteria. In addition, researchers detected some questions which are ambiguous during the pilot study, so they made major corrections to increase the intelligibility of the items. After that, participants took the placement test and were classified homogeneously based on their average scores.

Pre-test and post-test writing exams were the second instruments to measure their learning rates in terms of Academic Writing. Students explored 8 themes in writing classes, and researchers asked one of them in the pre-test and post-test randomly through an application. Grading criteria were announced in advance and some mock exams were held to be familiar with writing prompts. The rationale for conducting mock exams was that students asked questions to be clarified and reduced the exam anxiety by adapting to the types of questions. In the meanwhile, writing topics and grading criteria were proofread by three EFL experts because it was the researchers' priority to ask relevant questions which were not beyond their capabilities. Thus, face and

content validity were guaranteed by taking such measures in advance. Writing topics covered during the study are as follows:

- Climate change
- Gender Equality
- Internet addiction
- Pollution
- Poverty
- Traffic accidents
- Unemployment
- Unhealthy diet

The aforementioned topics were explored by sticking to the sequence of PBL, which necessitated defining the problem, underlining the solutions, checking the feasibility of the solutions, choosing the most rational solutions, and inserting them into the essays. As it is clear, collaboration was the key point to finding a lasting solution to chronic problems around the world. Once they had the background information about each topic, it was not so challenging for students to shoot their own responses in the exam mode individually.

The third research instrument was a survey which involved collecting data through a 5-point Likert scale questionnaire and a semi-structured interview. The questionnaire had 5 items, while the interview had 2 open-ended questions to receive students' genuine opinions about the effectiveness of PBL. It is worth mentioning that both questionnaires and interviews were piloted before the study, so their internal consistency and reliability criteria were ensured to conduct the research professionally and scientifically.

Data collection lasted 10 weeks in the even semester of the 2023-2024 academic year. More precisely, all students received a common workshop lasting two weeks so that they could become familiar with all important points of PBL. In the workshop, they were exposed to presentations, sample lessons, and videos of PBL applications globally. Upon the completion of two weeks, they were grouped to be in the treatment either in the control or experimental group. Having completed the workshop, the conduct of the lessons changed totally within the remaining eight weeks.

Control group students followed the activities of OWN IT 2 without switching to any extra materials. The OWN IT series was released by Cambridge University Press in 2020, and since then, its popularity has grown substantially thanks to teaching 21st-century skills and all linguistic skills with up-to-date content so students can find more common ground to be engaged and promote their learning significantly. To name a few, they read the passages, listened to the audio tracks, completed grammar and vocabulary exercises and wrote the topic given in the unit. Besides, paper-based writing mode was prevalent in the control group.

On the other hand, experimental group students received the same education except for the writing section, which was expanded with PBL. When it was the time to write, they gathered, defined the problem and came up with lasting solutions collaboratively. After that, they wrote the reflection to illustrate all stages which increased their productivity and accountability. Subsequently, each student wrote a novel essay about the given topic. It is essential to emphasize that a hybrid writing mode was employed in the experimental group, which was flexible to write on paper or send their essays electronically via features of Microsoft Forms. It is evident that control group students were exposed to teacher-centred education; however, many examples of student-centred education were noticed in the experimental group through PBL.

Researchers played pivotal roles in conducting the research by adhering to scientific procedures. Thus, students' fair grading was ensured at each stage. To illustrate, three wide-scale meetings were held with ELT experts to discuss writing exams' scope, duration, and grading. ELT experts have had solid experience covering academic writing courses for over 10 years. Subsequently, they have joined many seminars to sharpen their expertise in the field, so they can grade exam papers fairly. In this regard, items in the exam were refined by the whole team in order not to make any grave mistakes. Besides, research instruments were tested by other students who had the same characteristics. Based on their responses, some papers were evaluated in the meetings to dispel doubts and increase the confidence

of raters. Moreover, researchers requested to grade papers blindly by three raters. When there were considerable differences among raters, the committee displayed the paper and decided the final mark in cooperation. It is worth mentioning that the grading rubric included sub-categories about the overall organization, coherence, word choice, and use of conventions appropriately after examining the TOEFL and IELTS writing rubrics. It can be concluded that the researchers emphasize receiving valuable feedback and assistance from ELT experts in the institution to raise standards.

3.4 Data analysis

SPSS 29 and MAXQDA were the primary instruments to analyse data and come to reliable interpretations correspondingly. It can be elaborated that SPSS 29 was used to measure the differences between pre-test and post-test scores via independent samples t-test; whereas MAXQDA was employed to classify transcribed data in the interview and interpret accordingly under the heading of thematic analysis. McKim (2017) asserts that an independent samples t-test is commonly used to compare the means of two unrelated groups and come to statistical conclusions. Among many other methods to analyze interviews, thematic analysis was used for its convenience because it has certain steps to analyze the data properly, such as familiarization, coding, composing themes, removing redundant expressions and creating a refined report. Clarke and Braun (2017) elucidate that thematic analysis is a great method to understand participants' perspectives and gain insightful ideas in a statistically meaningful way. Besides, SPSS 29 was used to access to mean and percentages of the questionnaire. The phases of the study are visualized in **Figure 1** clearly.

As **Figure 1** illustrates, writing exams, questionnaires and interviews were used to gather specific information to address research questions and analyze differences through independent samples t-test, descriptive analysis and thematic coding, respectively.

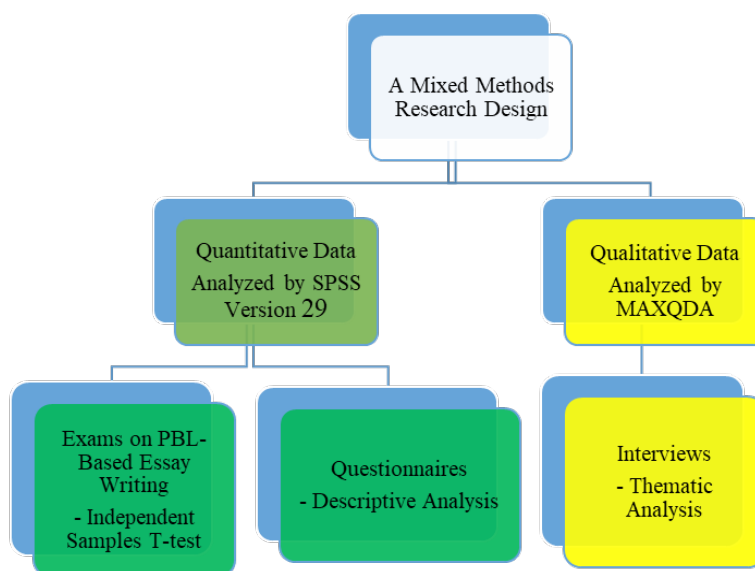


Figure 1. Stages of the study.

4. Findings

Findings were divided into two sub-categories to analyze quantitative and qualitative data more comprehensively so that differences could be measured more comprehensively and interpreted more precisely.

4.1 Quantitative analysis

Writing exams based on essays comprised the backbone of quantitative analysis in the form of pre-tests and post-tests so that gauging students' differ-

ences in writing could be ensured statistically. The principles of descriptive statistics were employed to address the first research question accurately.

The comparison of writing exams

Students' items in the exams were chosen from the pool, which consisted of 30 topics related to the themes covered. A topic was chosen randomly and directed to participants to shoot their responses within 30 minutes in the essay format. The results of the exams are illustrated in **Table 1** below:

Table 1. Results of independent samples t-test.

Variables	Measurement	N	M	SD	t	df	p
Pre-test	Control	25	56.40	11.860	--		
Pre-test	Experimental	25	56.20	11.662	060	48	0.952
Post-test	Control	25	63.60	9.301	--		
Post-test	Experimental	25	75	16.894	3090	38	0.003

As **Table 1** depicts, students' writing grades were close to each other in the pre-test process. Thus, a considerable difference was not measured in the pre-test considering the 0.952 p-value. However, a significant leap was observed in the post-test in terms of the experimental group; whereas the difference was far from being significant in the control group. In other words, a 0.003 p-value validates that experimental group students outperformed substantially af-

ter they took post-test writing exams in the aftermath of the treatment period.

Questionnaire

The questionnaire was designed to receive students' genuine opinions so that research questions could be addressed, thereby measuring the effectiveness rate of PBL. The findings revealed essential points in **Table 2**, which deserves close attention to analyze and synthesize.

Table 2. Participants' opinions on PBL.

Items	Mean	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
		%	f	%	f	%	f	%	f	%	f
1. PBL enhanced my performance considerably in the Academic Writing course.	4.52	80%	20	0%	0	12%	3	8%	2	0%	0
2. I was inclined to be more motivated in writing lessons after PBL.	4.80	88%	22	4%	1	8%	2	0%	0	0%	0
3. The phases of PBL stimulated my critical thinking skills.	4.88	92%	23	4%	1	4%	1	0%	0	0%	0
4. Collaborative exercises prompted me to write in a stress-free format.	4.48	72%	18	8%	2	16%	4	4%	1	0%	0
5. Interactive sessions helped me learn from each other.	4.24	64%	16	8%	2	20%	5	4%	1	4%	1
6. PBL inspired me to express my ideas more proactively in speaking lessons.	4.12	72%	18	4%	1	4%	1	4%	1	16%	4

The results of the questionnaire, as **Table 2** depicts, showed that PBL attracted the attention of students in several ways to enhance their performance in writing classes, elevate their motivation levels, encourage collaboration, unlock the potential of learning in interaction, increase critical thinking skills and inspire students to speak more assertively with varying popularity rates. For instance, item 1 was designed to determine whether a positive connection can be forged between PBL and gains in writing which yielded better results. To illustrate, the mean score was 4.52, which is considered significant progress. More specifically, 80% (n = 20) of the respondents opted to strongly agree; 12% (n = 3) of students chose neutral; 8% (n = 2) of respondents circled disagree. It needs to be emphasized that no student preferred to agree or strongly disagree. The results hint those respondents noticed a positive relationship between employing PBL-enriched education and having substantial gains in the Academic Writing course. Subsequently, item 2 was integrated into the questionnaire to determine whether PBL played an integral role in raising students' motivation in writing classes which showed that a positive link is available between boosting motivation and adopting PBL. To illustrate, the attention of 88% (n = 22) of respondents was captured by strongly agree, while 4% (n = 1) and 8% (n = 2) of the respondents opted in agree or neutral, respectively. On the contrary no respondent chose either disagree or

strongly disagree. In the subsequent phase, item 3 was analyzed thoroughly which revealed that there was a causal relationship between PBL and stimulating critical thinking skills, which was substantiated with a 4.80 mean score. More specifically, 92% (n = 23) and 4% (n = 1) respondents clicked on strongly agree or agree without leaving any room for hesitation. In addition, 4% (n = 1) of the respondents opted for neutral. On the other hand, no respondent chose to disagree or strongly disagree which verified the positive effects of PBL once more. Subsequently, item 4 was directed to respondents to know whether collaborative acts played prominent roles in relieving students' anxiety while writing, which unearthed that group work activities helped students to raise self-confidence and write in an anxiety-free format. To elaborate on the positive influence of PBL with figures, 72% (n = 18) of respondents chose to strongly agree; 8% (n = 2) of respondents opted in agree; 16% (n = 4) of respondents stayed neutral and 4% (n = 1) of respondents preferred disagree. Those figures hint that collaboration was appreciated; however, the satisfaction rate was not as high as previous items. The next item was designed to pinpoint whether PBL opens the way for interactive activities, which revealed that PBL has a moderate role in boosting interaction among respondents. More specifically, 64% (n = 16) of respondents chose strongly agree; 8% (n = 2) of the respondents opted to agree; 20% (n = 5) of respondents remained neutral and

4% (n = 1) of respondents preferred either disagree or strongly disagree, respectively. The last item in the questionnaire was inserted to determine whether there is a correlation between enhanced speaking performance and PBL which culminated in a positive gain albeit having a lower mean score, 4.12, than others. More specifically, 72% (n = 18) of respondents chose to strongly agree and 16% (n = 4) of respondents opted to disagree strongly. In addition, 4% (n = 1) of respondents preferred to agree, neutral, and strongly disagree, respectively.

4.2 Qualitative data analysis

Interview

Semi-structured questions encompassed the primary mode of the interview. Participants' opinions were welcomed, inserted into MAXQDA, classified, analyzed and interpreted correspondingly. A team of ELT experts offered assistance in each step when the need arose, so the data collection process was carried on incessantly. The precise description of interview questions is as follows:

- What are some pros and cons of PBL?
- Do you think PBL is effective in sharpening writing skills?

Although the researcher abridged the questions to two, numerous expansions were made by respondents to highlight the effects of PBL. Students' opinions were reflected by employing the principles of content analysis.

Thematic Analysis

Positive points of PBL were described in **Table 3** under five themes, all of which are considered fundamental in students' academic improvement. To name a few, the first theme was cooperation which was prioritized by four (16%) participants. It can be asserted that engaging in teamwork activities while defining the problems, offering solutions and writing reports in collaboration was appreciated by them. the second noteworthy theme was fostering 21st-century skills in various formats which captured the attention of five (20%) participants. It shows that teaching fundamental skills such as critical thinking, problem-solving,

and taking initiative was favored by participants. Subsequently, inquiry-based learning was emphasized by six (24%) participants as the third emerging theme. It can be elucidated that taking part in the initiative to find the most reasonable solution urged the learners to research further and expand their horizons. Afterwards, joining interactive sessions was underlined by three (12%) participants. These figures hint that interaction was underestimated at certain points. The final theme that rose to prominence was student-centered with a 28% (n = 7) preference rate. It is clear that undertaking responsibility to initiate the discussion, have a say and be a part of the solution was appreciated more than any other themes.

Table 3. Positive sides of PBL.

Theme	Frequencies f	Percentage %
Cooperation	4	16
21 st -century skills	5	20
Inquiry-Based Learning	6	24
Interactive	3	12
Student-centered	7	28

On the other hand, each coin has two sides. Participants expressed some weaknesses of PBL in **Table 4**, so taking them seriously can be fruitful for the betterment of PBL practices in the future. For instance, the first weakness of PBL emerged as demanding by two (8%) participants. It can be attested that the nature of thinking about major unsolved issues for decades demotivated some students. Afterwards, the repetitive cycle was expressed as one of the weaknesses of PBL by 3 (12%) participants. Having considered the figures, it can be stated that breaking the monotony can be effective in reversing this vicious cycle. The final weakness of PBL was pointed out as chaotic by one (4%) participant. Having taken it into consideration, it is safe to claim that discussing the themes under the leadership of the teacher was a tough task during controversial sessions.

Table 4. Weaknesses of PBL.

Theme	Frequencies f	Percentage %
Demanding	2	8
Repetitive	3	12
Chaotic	1	4

Apart from theme-based analysis, some participants' noteworthy ideas were given below in order not to have vague opinions about PBL:

Writing classes used to be boring for me until I was introduced to PBL. During this productive period, the teacher guided us to think independently, weigh our ideas with our peers and come to the most sensible solution. In addition, writing a report in the essay format collaboratively shaped my writing templates, thereby increasing my grades substantially. I wish I could have received the instruction in this format previously so that I could have reaped the benefits of PBL earlier. (St 8)

There was a huge gap between writing topics and our real lives in the past. On the contrary, this problem was addressed excellently in this study. We focused on problems prevalent in our current lives, so our motivation and enthusiasm were high during the study. We were inclined to think creatively, be more proactive, and gradually eliminate chronic problems. This period has left a lasting impression on me. I will remember it as I travel back in time to restore my memory. (St 12)

I am into doing research thoroughly on the internet, so I adapted to the study with ease. Having read the problems, we sought ways to eliminate them wisely. Thus, we scanned many pages to expand our knowledge. Finally, we merged our ideas to find common ground and convert our ideas into an essay mode collaboratively. As a result, outlining the problem, scanning countless websites, and composing the final essay altogether were catchy points which boosted my motivation considerably in this study. (St 18)

One of the most important gains of this study is to be equipped with 21st century skills in this study. My teacher made a presentation about such skills in advance. Thus, we learned the significance and how to activate them. For example, creativity, critical thinking, problem-solving, communication, leadership, ICT and media literacy were at the forefront of the study which attracted our attention instantly and kept us active. (St 21)

In the final stage, triangulation was applied to see whether the collected data matched each other. Once

all collected data were triangulated, it was confirmed that they were harmonious with each other. Thus, it is safe to conclude that PBL's positive effects on students' writing and creative thinking skills were validated by all instruments without leaving any room for doubt.

6. Discussion

The impacts of PBL on the writing enhancement, boosted motivation and improved critical thinking skills of EFL learners at the tertiary level were examined by adopting a mixed-methods research design study through exams, questionnaires, and interviews in this study so that research questions could be addressed adamantly. Quantitative findings documented that PBL is a promising approach to empowering students in Academic Writing courses, enhancing motivation, and fostering critical thinking skills. In other words, students whose lessons were enriched with PBL outperformed others who received the writing course in a traditional format, as the curriculum suggested. The substantial gains in writing can be ascribed to the effects of instruction, in which PBL was activated through brainstorming, negotiation, devising strategies, and resolving issues collaboratively. Apart from writing exams, the findings of the questionnaire uncovered noteworthy points in terms of addressing research questions. For instance, the questionnaire results revealed that those students noticed considerable gains in their writing performance. This finding dovetails with a previous study by Dastgeer and Afdal (2015), who have elucidated that PBL is equal to writing enhancement when steps are implemented professionally. Another noteworthy point in the questionnaire to be emphasized is critical thinking and problem-solving skills. Most of the students stated that PBL is an awesome approach to increasing their critical thinking skills gradually. This finding aligns with the study of Adam Katie (2023), who has pointed out that problem-solving-based initiatives can unlock students' potential to be critical thinkers and write their ideas more persuasively by considering many points of view. Subsequently, more than half of respondents reiterated that their

intrinsic motivation was boosted after receiving the treatment by PBL because the topics were taken from real-life problems to be discussed by students. Regarding this finding, Yang (2023) contends that PBL plays an integral role in boosting students' motivation through engaging topics and dynamic stages. Afterwards, three-quarters of respondents stated that placing collaboration and interaction at the heart of education in PBL fostered their learning, thereby changing their overall attitude toward writing courses positively and passing on this enthusiasm to speaking activities. In this regard, Ardiyanto (2024) argues that designing lessons to activate pair work can increase interaction, giving students ample opportunity to improve their writing skills and transfer them to other essential skills. Qualitative findings also complemented quantitative ones flawlessly. The second tool to receive students' opinions on PBL was an interview which reflected significant aspects to be mentioned. To name a few, employing principles of inquiry-based learning was one of the reasons to support PBL. Students reiterated that the cycle of being familiar with the problem and seeking ways to eliminate it continuously motivated students to do comprehensive research via traditional library means and online websites. According to Kara (2023), students are driven by epistemic curiosity to expand their learning in classes with further examples on numerous informative websites. Thus, they can show a far better performance in writing classes. In the same vein, many students stated that they developed strategies to put 21st-century skills into their lives through PBL because cooperation, initiative, responsibility, ICT, media and civic literacy were emphasized many times during the study. This finding is in line with Bilgin's (2024) study, which has culminated in a positive link between teaching 21st century skills and increasing academic success simultaneously.

A further discussion of the findings can be devoted to the adoption of CLT in each step of the study. Exchanging ideas in a constructive way was prevalent throughout the study via brainstorming, negotiation, analysis, evaluation and synthesis tasks. Each task required students to take part in communi-

cative activities. In addition, forming a final product to elaborate their opinions in the essay format urged students to be more responsible and accountable because they felt that their works would be read, interpreted and evaluated in minute detail. Similarly, they also knew that their works could be used practically when their ideas were found noteworthy and feasible. Thus, the positive atmosphere continued as they had the noble ideas to solve chronic problems with viable master plans. Caybot et al. (2024) have asserted that communicative language teaching has far-reaching effects in EFL classes ranging from enhanced motivation to increased exam performance. In the same vein, Rania Aouissi (2023) has suggested that CLT and PBL go hand in hand to increase students' satisfaction rate thereby increasing academic success substantially. Likewise, Aytac and Kula (2018) have pointed out that CLT is a miraculous approach to switch from teacher-centred to student-centred methods which is realized excellently in PBL classes.

Based on the findings of the study, some pedagogical implications are illustrated. Firstly, educational institutions should integrate PBL into the Academic Writing curriculum to reap the benefits. Thus the gap between theoretical and practical knowledge can be closed. Secondly, teamwork activities should be compulsory in EFL classes in a manageable mode, so cooperation and interaction can be at the centre of lessons. Thirdly, authorized bodies at educational institutions should be aware of students' stress sources in EFL classes to take rational measures to have more engaging classes in the upcoming weeks. Besides, fostering 21st-century skills should be necessary in educational settings because they pave the way for more responsible students to learn more ambitiously and wisely.

7. Conclusions

This research purported to explore the impacts of PBL on the writing performance of students at the university level. Findings unearthed that PBL raised students' marks considerably in Academic Writing courses. Additionally, the results evidenced that students' motivation levels rose substantially af-

ter receiving the treatment through PBL via various mind-blowing communicative activities. Moreover, students' creative thinking skills were stimulated so that increased problem-solving skills were observed. Furthermore, cooperation and interaction were cited as reasons to relieve stress while writing essays. Besides, students' overall attitudes towards the Academic Writing course changed positively after joining PBL enriched writing tasks actively. Those points can be an inspiration for authorized bodies of educational institutions to employ PBL enriched writing education, thereby allowing the learners to reap the benefits in many ways, ranging from developing writing skills to improving self-confidence throughout their lifespans; because PBL motivates students to be life-long learners and explore all possibilities until they are satisfied with the knowledge provided.

With respect to the study's limitations, a wide range of suggestions are made for further research. To begin with, this study was confined to measuring the effects of PBL on writing performance, which can be extended to other macro and micro-skills. In addition, only freshman students were included at a university in this study, which can be expanded to sophomore, junior and senior students. After that, the number of groups can be increased to compare PBL with other prominent methods such as project-based, content-based or inquiry-based learning methods. Finally, further statistical analysis can be conducted to determine whether there will be differences in students' performance in terms of gender, age and educational background.

Author Contributions

Recep Celik and Yunus Yildiz contributed equally to this work. Both authors were involved in the conceptualization and design of the study. Recep Celik conducted the data collection and analysis, while Yunus Yildiz focused on the interpretation of the results and manuscript preparation. Both authors reviewed and approved the final manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability Statement

The authors assure that findings are supported with concrete data. Raw data can also be shared by authors with interested parties upon the request.

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