THE POWER OF PBL AND TPACK: CATALYSTS FOR ELEVATING STUDENTS' WRITING LEARNING OUTCOMES

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A B S T R A C T

The English writing learning process is crucial in English language education, but it often faces challenges such as limited resources and ineffective teaching methods. To address these issues, this study explores the use of Problem-Based Learning (PBL) integrated with Technological Pedagogical Content Knowledge (TPACK) in the context of English as a foreign language (EFL) learning, specifically in the writing course. The research aims to investigate how the integration of PBL and TPACK can enhance students' writing learning outcomes (assessing their content and clarity, structure of the writing, and language quality). The research follows a Classroom Action Research (CAR) design with a quantitative approach. The subjects consist of 10th-grade students from a public high school in Pasuruan Regency, with a total of 33 participants. Data collection instruments include pre and post writing tests and observation. Data analysis is conducted using Microsoft Excel, employing percentages. The findings demonstrate that the implementation of PBL integrated with TPACK leads to significant improvements in students' writing learning outcomes. In the pre-cycle, the pass percentage was only 39.39%, while in cycle I, it increased to 75.76%, and in cycle II, it reached 93.94%. This study contributes to the development of curricula and teaching methods for English writing. These findings have important implications for future writing instruction that can help improve students' writing learning outcomes. This study's limitations are constraining the applicability of its findings to diverse educational environments and a relatively brief timeframe. Future research could explore cross-cultural variations, delve into extended research periods, and compare the effectiveness of PBL and TPACK with alternative teaching models in EFL education.

INTRODUCTION

The English Writing learning process is one of the important aspects of English language education for students (Lee & Schmidgall, 2020). Especially, English is a global language used in various contexts, including business, education, and international communication. Proficiency in English writing enables students to express their ideas and thoughts clearly and effectively, expanding their academic and career opportunities, and allowing them to

participate in global cultural exchanges. However, there are several problems frequently encountered in this learning process. One common issue is students' difficulty in effectively organizing their ideas in written form (Alfaki, 2015; Husna, 2017). Students often struggle with constructing grammatical and coherent sentences, as well as facing challenges in developing their ideas in a structured manner (Dwinuryati et al., 2018; Rahmatunisa, 2014). Additionally, a lack of understanding of grammar rules and appropriate vocabulary also poses obstacles in this learning process (Fareed et al., 2016). Some students also experience a lack of proficiency in text production skills, a lack of knowledge related to the subject matter of the writing task, and a lack of interest in learning English (Yoandita, 2019). All of these issues can impact students' ability to express their ideas effectively in written English, ultimately resulting in poor writing learning outcomes (Dhanya & Alamelu, 2019).

One of the public high schools in Pasuruan Regency faces serious challenges in achieving satisfactory learning outcomes in English Writing. The low learning outcomes can be attributed to several factors that need to be considered. First, the limited resources available pose a constraint in supporting English Writing learning. The lack of relevant textbooks and teaching materials, as well as limited access to technology and digital resources, can hinder students' ability to develop their writing skills (Alamri, 2021). Second, the teaching methods used also contribute to low learning outcomes. English Writing instruction primarily focuses on teaching rules and theories without providing sufficient opportunities for students to actively practice, resulting in a lack of adequate practical experience to sharpen their writing skills (Yulientinah et al., 2020).

To address the issue of low learning outcomes in English Writing at the public high school in Pasuruan Regency, several steps can be taken. First, there is a need to improve access to relevant learning resources, such as textbooks, teaching materials, and technology that can be used in the learning process. Implementing the TPACK (Technological Pedagogical Content Knowledge) approach can assist teachers in effectively integrating technology into the learning process, enabling students to acquire the necessary resources to develop their writing skills (Hanik et al., 2022). TPACK can enhance student learning outcomes through appropriate technology integration, innovative teaching approaches, increased student engagement, and support for differentiated learning (Sutiani et al., 2022). Through TPACK, teachers can create engaging learning experiences, facilitate access to a wider range of resources, and deliver relevant content. By using technology appropriately, teachers can motivate students, encourage active participation, and provide personalized learning experiences (Ngatminiati et al., 2023). This contributes to improved understanding, critical thinking skills, and student learning outcomes. Furthermore, the teaching methods employed need to actively involve students in the writing process. Adopting a Problem-Based Learning (PBL) approach can be an effective solution (Dastgeer & Tanveer Afzal, 2015). In PBL, students are given challenging and meaningful writing tasks that require problem-solving and direct application in real-life contexts (Sofyan & Komariah, 2016). Students will be given opportunities to collaborate, gather information, and formulate solutions to enhance their writing abilities (Suardana, 2019).

Previous research has shown the potential of using a PBL approach integrated with TPACK in the context of education. For example, a study by Tanjung et al. (2022) in the International Journal of Education in Mathematics, Science, and Technology explored a TPACK-based PBL model. The research revealed that this approach can enhance students' problem-solving skills and conceptual understanding. Additionally, a study by Stefani et al. (2021) in the Jurnal Pendidikan Tambusai investigated the implementation of a TPACK-based PBL model in integrated thematic learning for fifth-grade students. The results of this study demonstrated an improvement in the students' learning process through the use of a PBL model that integrated with TPACK. However, despite several studies integrating the TPACK and PBL approaches, there is limited research that has been conducted in the context of English as a

foreign language (EFL) learning, particularly in the writing course. This indicates a research gap that needs to be addressed. Therefore, this study explores the use of TPACK and PBL in the context of EFL learning, specifically in the writing subject, with the hope of providing new insights and contributing to the enhancement of students' writing learning outcomes. Therefore, this study answers the following question:

The purpose of this study is to investigate the use of PBL integrated with TPACK in the context of EFL learning, specifically in the writing course. This research aims to examine how the integration of PBL and TPACK can enhance students' writing learning outcomes. This study is also urgent in the context of EFL learning in Indonesia, particularly in the development of more relevant and effective curricula and teaching methods. This research is significant in improving students' writing learning outcomes in EFL education. By employing the PBL approach that encourages active student participation in the learning process, and the TPACK approach that integrates knowledge of technology, pedagogy, and content, it is expected to provide an innovative and effective approach to enhancing student' writing abilities. By addressing the existing research gap, this study can provide a better understanding of the use of PBL and TPACK in EFL writing learning. The findings of this research are expected to provide new insights for educators and policymakers in designing more effective learning strategies to improve students' writing learning outcomes.

RESEARCH METHOD
Research Design
This research was designed as Classroom Action Research (CAR) that employed a quantitative approach. CAR is a systematic process that involves individuals reflecting, inquiring, and taking action regarding their own professional practice (Morales, 2016). The research consisted of two cycles, with each cycle comprising four steps: planning, action, observation, and reflection (Kemis and Mc Taggart, 1998). The primary focus of this study was on quantitative data analysis to examine the outcomes and effects of the implemented interventions. This research was conducted in two cycles to investigate the effectiveness of integrating Problem-Based Learning (PBL) and TPACK framework on students' writing learning outcomes. The first cycle involved the implementation of PBL coupled with TPACK-based instructional strategies activities, followed by an evaluation of the students' writing performance. The second cycle then focused on refining the implementation of PBL and TPACK to further enhance students' writing abilities.

Research Subject
The subjects of that study were 10th-grade students in one of the public high schools in Pasuruan Regency. The total number of students involved in that research was 33. The selection of those subjects was based on several underlying reasons. The 10th grade was a critical level in secondary education, where students started studying the English language in greater depth. Therefore, it was important to identify the factors that influenced the writing learning outcomes at that stage and implement appropriate interventions. By involving those research subjects, it was expected to develop suitable learning strategies focused on improving the writing outcomes of the students in high school.

Data Collection
Data collection for this research involved two primary methods: pre-test and post-test assessments, and observations. A pre-test assessed initial knowledge and skills, followed by an intervention focused on improving writing skills. Two post-tests, similar in content to the pre-test, gauged the impact of the intervention. The pre-test is conducted before the teacher takes any action in the classroom, whether related to PBL or TPACK (Pre-cycle). Post-tests are conducted twice every time there is an intervention to improve students' writing outcomes

related to the integration of PBL and TPACK (Cycle I and Cycle II). Both assessments were conducted under standardized conditions. Additionally, observations were carried out to provide more insights into the learning process and participants' engagement, enhancing the overall assessment of the intervention's effectiveness.

Instruments

The research instruments used in that study included a writing test and observation. The writing test was used to measure students' writing abilities and identify changes in writing outcomes from cycle to cycle. The test was designed with clear and objective assessment criteria to measure important aspects of writing, such as sentence structure, cohesion, coherence, and the use of appropriate vocabulary. Those writing criteria were objectively classified into three major criteria for assessing the quality of students' writing: Content and Clarity, Structure of the Writing, and Language Quality. In addition to the writing test, observation was also an important instrument in that research. Observation was conducted to gather information about the activities and interactions between students and the teacher during the writing learning process. Observation involved direct observation of students as they engaged in writing activities, such as how they planned their writing, used available resources, and interacted with their classmates. The observational data provided deeper insights into teaching practices and student engagement in writing activities.

Data Analysis

The data in this study were analyzed using Microsoft Excel. The data analysis process involved several stages. First, the data from the writing test and observation were collected and inputted into Microsoft Excel spreadsheets. Next, student scores were calculated using predetermined formulas. These formulas took into account the weightage of each relevant assessment aspect in determining the students' scores. After calculating the student scores, the passing percentage was computed using a simple percentage formula, which is the percentage of students who passed the examination.

The minimum passing criterion set for each student was 75. The calculated passing percentage data were interpreted to assess the extent to which students achieved the established passing level. By using Microsoft Excel as the analysis tool, this research obtained accurate results and facilitated efficient data processing and calculation of students' passing percentages. The success criteria in this classroom action research used a guideline for converting absolute scores on a five-point scale. The conversion guidelines for student learning outcome scores were as follows:

Table 1
Research Success Criteria

No	Percentage Interval (%)	Category
1.	85 – 10-	Very Good
2.	70 – 84,5	Good
3.	55 – 69,9	Fair
4.	40 – 54,9	Poor
5.	0 – 39,9	Very Poor

(Agustina, 2013)

RESEARCH FINDINGS AND DISCUSSION
Research Findings

The study examined the influence of integrating PBL (Problem-Based Learning) and TPACK (Technological Pedagogical Content Knowledge) strategies in a real classroom setting, with a focus on enhancing students' writing learning outcomes. The findings underscore the positive impact of combining these approaches on learning outcomes, which is supported by the data presented in Table 2.

Table 2
Students' Writing Learning Outcomes

No	Aspect	Pre-cycle	Cycle I	Cycle II
1.	Total number of students	33	33	33
2.	Number of students who passed the minimum competency level	13	25	31
3.	Number of students who did not pass the minimum competency level	20	8	2
4.	Passing rate	39.39%	75.76%	93.94%
5.	Increase in passing rate from the previous cycle	-	92.31%	24%

In the pre-cycle phase, the integration of the PBL and TPACK models has not been implemented. The teacher still uses a conventional teaching approach that emphasizes explaining rules and theories without providing sufficient opportunities for students to actively practice, resulting in limited practical experience for students. As a result, only 39% of students achieved learning outcomes in writing that met the Minimum Mastery Criteria (KKM).

In Cycle I, through the integration of PBL and TPACK, there was a significant improvement in students' writing learning outcomes. This can be seen from the graduation rate of 75.76%, categorized as "good". The graduation rate from the previous cycle, the pre-cycle, was very high at 92.31%, this improvement demonstrates the positive impact of implementing the PBL and TPACK approaches in writing learning. TPACK was used by utilizing the Canva website to create mind maps, Google Docs to compose recount texts, and Google Classroom to work and share the results of the students' writing. Additionally, the teacher provided guidance on the steps to find literacy sources on the internet using Artificial Intelligence (AI) so that students could acquire additional data for their writing and richer knowledge.

However, the researchers assessed that the graduation rate of students' writing learning outcomes still needs to be improved to reach a more optimal level. Additionally, observation results indicated that the significant improvement in students' writing was only in terms of the structural aspect. However, for the clarity of content and language quality aspects, there is still a need for more significant improvement. Reflection results also indicated that treatment improvements, especially in terms of enhancing the clarity of content and language quality in students' writing, were needed. Based on these findings, the researchers decided to proceed to Cycle II with the aim of making improvements.

In Cycle II, there was a significant increase in the graduation rate of students' writing learning outcomes. The percentage of students who achieved a passing grade in KKM increased to 93.94%, with excellent results. The percentage of improvement was 24% compared to the previous cycle (Cycle I). Based on the results of Cycle II, the implementation of TPACK integrated to PBL considered successful and has achieved the set goals, leading the researchers to terminate the research cycle. Similar actions as in the Cycle I were taken with improvements in the implementation of TPACK. The teacher added a peer-review activity to enhance the quality of students' writing in terms of content clarity. Additionally, the teacher utilized additional technology, such as the Grammarly application, to improve the language quality aspect of students' writing.

Discussion

The integration of PBL and TPACK models can be a potential solution in improving student learning outcomes (Tanjung et al., 2022). PBL teaches students to learn through solving real-world problems, allowing them to develop problem-solving skills, collaboration skills, and

the application of knowledge in relevant contexts (Sofyan & Komariah, 2016). Meanwhile, TPACK combines technological understanding with subject matter understanding, enabling teachers to effectively integrate technology in the learning process (Hanik et al., 2022). By integrating the PBL and TPACK models, teachers can provide more meaningful and engaging learning experiences for students. They can involve students in identifying and solving real-world problems, utilizing relevant technology, and collaborating with classmates (Hanik et al., 2022; Sofyan & Komariah, 2016). Through this approach, students can develop a deeper understanding of the subject matter and actively improve their writing skills.

Based on the research findings, the implementation of the PBL and TPACK integration in learning can lead to improved student writing learning outcomes. These findings support the previous findings of Tanjung et al. (2022) and even fill in the gap. The integration of PBL and TPACK has a significant impact on English language learning, not only improving problem-solving skills but also the practical use of English in writing. The integration of the PBL model brings about changes in the teaching approach used by teachers. In PBL, students are encouraged to actively participate in solving real-world problems, making them more engaged in the learning process and involving their critical thinking skill (Dastgeer & Tanveer Afzal, 2015). In the context of writing learning, students have a greater opportunity to actively practice composing recount texts. Therefore, they can develop their writing skills better compared to the conventional teaching approach that only provides direct theoretical explanations.

Secondly, the implementation of TPACK also plays a crucial role in improving student learning outcomes. By utilizing various technologies such as Canva, Google Docs, and Google Classroom, students can use these tools to organize their thoughts, share their work with classmates, and receive real-time feedback from teachers. These technologies provide support in the learning process and enable students to become more skilled in using technology relevant to writing learning (Sutiani et al., 2022). With TPACK, students can integrate technological understanding with subject matter understanding, thus enhancing their ability to produce better writing. This is in line with Ngatminiati et al. (2023), who state that with TPACK, students become more active in applying their understanding of the subject matter as they are motivated by the use of relevant technology. Additionally, Ngatminiati et al. (2023) also state that the use of technology opens up broader access for students to obtain additional literacy resources. In writing learning, students can utilize the internet to search for references, articles, and up-to-date information relevant to the topics they are writing about. This provides students with richer and deeper knowledge, allowing their writing to be more informed and of higher quality.

By deeply analyzing the factors that influence student learning outcomes, several further steps can be identified to enhance the quality of writing instruction. First, reflection on the clarity of content in students' writing needs to be conducted. Teachers can examine in more detail the difficulties or obstacles students face in expressing their ideas clearly. By doing so, teachers can provide more precise and tailored technological implementations that cater to students' needs (Sutiani et al., 2022). Additionally, teachers can provide more specific guidance in developing clarity of content, such as offering concrete examples or engaging students in discussions and group debates to enhance their understanding of structure and idea development in writing. This way, students can acquire a collaborative understanding that aligns with what should be included in PBL (Suardana, 2019). Second, a deeper evaluation of the language quality in students' writing needs to be considered. Teachers can analyze the grammatical errors frequently made by students, such as sentence structure, the use of standardized vocabulary, punctuation, and so on. Based on this analysis, teachers can design learning activities that specifically focus on improving students' language quality. For example, by providing exercises for rewriting incorrect sentences or encouraging students to use more varied and accurate vocabulary.

In integrating PBL and TPACK, adjustments should be made in the use of technology and other aids. Teachers can explore alternative technologies that are more suitable and effective in helping students develop writing skills (Ngatminiati et al., 2023). For instance, the use of online platforms that provide collaboration features and direct feedback from teachers and classmates. By utilizing appropriate technology, students will be more engaged and motivated in the writing-learning process. Additionally, besides technological updates, it is necessary to consider the use of higher-quality additional literacy resources. Teachers can provide specific guidance on how to identify reliable and topic-relevant literacy sources. This way, students will be better able to acquire quality and accurate information to support their writing. In terms of clarity of content, the addition of peer-review activities should be addressed to enhance the quality of students' writing. Through the peer-review process, students can provide feedback and suggestions to each other to improve the clarity of their writing. This activity helps students to see perspectives from other readers and enhances their understanding of how to communicate ideas clearly and coherently. Such activities align with collaborative learning in PBL (Suardana, 2019). Thus, improvements in the clarity of content can be achieved through collaboration and peer learning.

Furthermore, the use of the Grammarly application as an aid in the aspect of language quality in students' writing also has a positive impact in the use of PBL and TPACK to improve students' learning outcomes. Grammarly is an application that automatically checks grammar, spelling, and writing style. By using this application, students can correct grammar mistakes and enhance the language quality of their writing. The use of this additional technology provides students with the opportunity to independently address their language errors and improve their overall writing skills. The improvement in the use of technology in the implementation of TPACK accurately addresses students' needs to enhance the quality of their writing, which aligns with Ngatminiati et al. (2023), stating that technology should be used appropriately according to the goals and needs. The improvement in the implementation of TPACK in Cycle II also assists teachers in effectively integrating technology into the learning process, enabling students to access the necessary resources to develop their writing skills (Hanik et al., 2022).

The integration of PBL and TPACK by utilizing some additional adequate technology for writing skills further support the study by Tanjung et al. (2022) and Stefani et al. (2021), which found that the integration of PBL and TPACK can enhance students' skills and learning outcomes. This study is significant on multiple levels. Firstly, within the context of EFL learning in Indonesia, it contributes to the development of curricula and teaching methods for the English writing that are not only more relevant but also more effective. Secondly, these findings have important implications for future writing instruction. The integration of PBL and TPACK models, along with the appropriate use of technology, can help improve students' writing learning outcomes.

The significance is evident in the innovative approach it employs. By combining the PBL approach, which fosters active student engagement in the learning process, with the TPACK approach, which seamlessly integrates technology, pedagogy, and content knowledge, the study seeks to provide a groundbreaking and effective method to enhance students' writing abilities. Furthermore, this research addresses a significant research gap in the field, shedding light on the utilization of PBL and TPACK in EFL writing course. By doing so, it contributes to a deeper and more comprehensive understanding of these approaches in this specific context. Ultimately, the findings of this research hold the potential to offer fresh insights for educators and policymakers. It can assist them in devising more potent learning strategies aimed at improving students' writing learning outcomes.

CONCLUSION

The use of PBL based on TPACK effectively enhances students' writing learning outcomes in English as a Foreign Language (EFL) instruction. By integrating the PBL and TPACK models, teachers can provide more meaningful and engaging learning experiences for students which lead to their better writing learning outcomes. The integration of PBL and TPACK provides an innovative approach that can improve the quality of students' writing. In the context of EFL learning in Indonesia, this research has high urgency in the development of relevant and effective curricula and teaching methods. The study provides several recommendations that can be implemented. First, it is important to develop an EFL learning curriculum that considers the use of PBL and TPACK as effective strategies to enhance students' writing learning outcomes. The learning materials should be designed with attention to relevant content and the appropriate use of technology. Second, EFL teachers need to receive adequate training on the implementation of PBL and TPACK in writing instruction. This training will help teachers develop the knowledge and skills needed to integrate technology effectively in teaching and to design and implement PBL approaches. Lastly, collaboration between teachers and students, as well as reflection, is an important component in the implementation of PBL based on TPACK. Teachers can encourage students to work collaboratively in completing complex writing tasks, while students can learn from their own experiences and peer reflections. This study has specific limitations that deserve attention. Firstly, it concentrated on the Indonesian context, potentially constraining the applicability of its findings to diverse educational environments. Secondly, the research spanned a relatively brief timeframe, potentially obscuring the long-term sustainability of the improvements observed in students' writing abilities. To address these limitations and advance our understanding, future research could explore cross-cultural variations, delve into extended research periods, and compare the effectiveness of PBL and TPACK with alternative teaching models in EFL education.

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