ENHANCING EFL READING COMPREHENSION SKILLS THROUGH PROBLEM-BASED LEARNING: EVIDENCE FROM STUDENT ENGAGEMENT AND STRATEGY USE

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Abstract
Reading comprehension remains one of the most essential yet challenging skills for English as a Foreign Language (EFL) learners. Traditional reading instruction often emphasizes teacher-centered approaches that limit students' active involvement in meaning-making. This study investigates the impact of Problem-Based Learning (PBL) on enhancing EFL students' reading comprehension skills, engagement, and strategy use. A quasi-experimental design was employed with two groups of undergraduate EFL learners: an experimental group (n = 35) receiving PBL-based reading instruction and a control group (n = 35) taught through traditional teacher-led methods. Data were collected using a reading comprehension test, an engagement questionnaire, and a reading strategies inventory. Results revealed that the PBL group achieved significantly higher post-test scores than the control group, indicating improved reading comprehension performance. Moreover, PBL fostered greater behavioral, emotional, and cognitive engagement, alongside the increased use of higher-order reading strategies such as inferencing, summarizing, and critical questioning. These findings suggest that PBL provides a more interactive and meaningful framework for teaching reading, enabling learners to become active participants in constructing textual meaning. The study highlights pedagogical implications for EFL educators, recommending the integration of real-world problems into reading instruction to enhance comprehension outcomes.

Keywords: *problem-based learning, efl, reading comprehension, student engagement, reading strategies*

Introduction

Reading comprehension is widely recognized as a cornerstone of language learning, as it equips learners with the ability to process and interpret texts for academic and communicative purposes. In the context of English as a Foreign Language (EFL), reading comprehension plays a vital role in enabling students to access knowledge, expand vocabulary, and develop critical thinking skills necessary for higher education and professional settings (Grabe & Stoller, 2019). Despite its importance, many EFL learners continue to struggle with understanding texts, often relying on surface-level decoding

rather than engaging deeply with meaning. This difficulty suggests the need for innovative pedagogical approaches that can foster more active, strategic, and meaningful reading.

In many EFL classrooms, reading instruction remains heavily teacher-centered, with an emphasis on translation, vocabulary lists, and comprehension questions (Al-Issa & Al-Bulushi, 2012). While these methods provide some benefits, they tend to limit students' active involvement in meaning-making and discourage independent strategy use. Learners often become passive recipients of information, focusing narrowly on word-level comprehension without developing the higher-order thinking skills needed for inference, synthesis, and evaluation (Thamrin et al., 2019; Iskandar et al., 2021). This condition not only reduces engagement but also hinders learners' long-term development as autonomous readers.

Another major weakness in existing EFL reading instruction is the lack of authentic and contextualized materials. Traditional approaches frequently employ decontextualized texts and exercises that fail to connect reading to learners' real-world needs (Day & Bamford, 2002). Without opportunities to engage with meaningful problems or contexts, students are less motivated to invest cognitive and emotional effort in reading tasks. Motivation and engagement, however, are key predictors of reading comprehension success (Guthrie & Wigfield, 2000). This highlights the importance of instructional methods that integrate authentic tasks and stimulate learners' curiosity.

Problem-Based Learning (PBL) has emerged as a promising pedagogical approach to address these challenges. Rooted in constructivist theory, PBL emphasizes student-centered inquiry, collaboration, and problem-solving through the use of authentic, real-world issues as learning triggers (Yew & Goh, 2016; Hendry et al., 1999). Previous studies have demonstrated that PBL enhances learner engagement, promotes critical thinking, and fosters deeper understanding across various disciplines (Hmelo-Silver, 2004). Within the field of language education, PBL has been shown to improve skills such as speaking, writing, and vocabulary development, though its application to reading comprehension remains relatively underexplored (Mubarak et al., 2023; Mutammimah & Padli, 2023; Tan, 2003).

Integrating PBL into EFL reading classrooms has the potential to transform students' experiences with texts. By engaging learners in group-based problem-solving tasks grounded in reading materials, PBL encourages them to analyze, synthesize, and evaluate information collaboratively (Cahya et al., 2023) (Sudarmika, 2021) (Meilani et al., 2024). This process shifts the focus from rote comprehension checks to active construction of meaning, supporting the development of strategic reading skills such as predicting, questioning, and summarizing (Akuba & Pido, 2024) (Ly, 2020) . Furthermore, the collaborative and inquiry-based nature of PBL fosters higher levels of behavioral, emotional, and cognitive engagement, which are essential for sustained improvement in reading proficiency (Iskandar et al., 2021; Rianti et al., 2024; Fredricks et al., 2004).

Therefore, this study seeks to examine the effectiveness of PBL in enhancing EFL students' reading comprehension. Specifically, it investigates whether PBL can improve learners' comprehension test scores, increase their engagement in reading activities, and promote more effective strategy use compared to traditional teacher-centered instruction. By addressing these objectives, this research contributes to the growing body of literature on innovative methods for EFL reading instruction and provides practical insights for teachers seeking to improve student outcomes through active and

meaningful learning. The novelty of this study lies in its integrated examination of comprehension achievement, learner engagement, and strategy use through PBL within Indonesian EFL classrooms—a context where prior research has been scarce and largely fragmented.

Method

This study adopted a quasi-experimental, non-equivalent control group design to evaluate the effects of problem-based learning (PBL) on EFL undergraduates' reading comprehension, engagement, and strategy use. Two groups were involved: an experimental group that received PBL treatment and a control group that received traditional instruction. Both groups completed pre-tests and post-tests to measure changes in comprehension, engagement, and reading strategies. The reading materials employed in the PBL intervention—comprising global issues, cultural texts, and case studies—were subjected to a systematic process of selection and validation to ensure their suitability for the participants' proficiency level. First, potential texts were gathered from authentic sources such as international news portals, cultural magazines, and educational case repositories. These texts were screened according to three predetermined criteria: (a) topical relevance to higher education contexts, (b) alignment with the course objectives, and (c) readability within the intermediate–upper intermediate range, corresponding to the expected proficiency of undergraduate EFL learners.

To validate the materials, two independent EFL experts with over ten years of teaching and curriculum design experience evaluated the texts based on linguistic difficulty, content appropriateness, and cultural sensitivity. Their inter-rater agreement exceeded 85%, indicating strong consistency in the validation process. In addition, quantitative readability checks were performed using the Flesch–Kincaid readability formula to confirm that the texts were not excessively complex. Finally, the materials were piloted with a group of 10 non-participating students from the same program to obtain feedback on comprehensibility and engagement. Based on the expert judgments, readability analysis, and pilot results, only the materials that met all criteria were retained for the intervention. Table 1 illustrates the flow of the study:

Table 1. Flow of the Study Design

Stage	Experimental Group (PBL)	Control Group (Traditional Instruction)
Pre-test	Reading comprehension test, Engagement questionnaire, Strategies inventory	Same instruments administered
Intervention (6–8 weeks)	PBL sessions using authentic reading problems (global issues, cultural texts, case studies)	Teacher-led reading instruction (text explanation, vocabulary drills, comprehension questions)
Post-test	Same instruments administered	Same instruments administered
Data Analysis	Paired t-test, ANCOVA, MANOVA, Descriptive statistics	Same analytical procedures applied

Participants were 70 undergraduate EFL students (aged 18–21) enrolled in an English course program at a university in Indonesia. They were divided into two groups: the experimental group (n = 35), who engaged in PBL sessions, and the control group (n = 35), who received traditional teacher-led instruction. A non-random sampling technique was employed due to intact class structures, which is common in quasi-experimental educational research. A standardized comprehension test was designed, covering multiple-choice, short-answer, and inferential items. The test was piloted for reliability, achieving a Cronbach's alpha of .82, indicating strong internal consistency.

Students' behavioral, emotional, and cognitive engagement were measured using a Likert-scale questionnaire adapted from Fredricks et al. (2004). The scale has been widely validated in educational settings. Strategy use was assessed using the Survey of Reading Strategies (SORS) developed by Mokhtari and Sheorey (2002). This inventory measures global, problem-solving, and support strategies, providing insight into learners' metacognitive awareness during reading.

The study was implemented over an eight-week period to investigate the effectiveness of problem-based learning (PBL) in enhancing students' reading comprehension. The participants were divided into two groups: an experimental group and a control group. The experimental group received instruction through PBL sessions, which were designed around authentic reading problems such as global issues, cultural texts, and case studies. Students worked collaboratively in small groups, where they actively engaged in problem analysis, identified appropriate reading strategies, and reflected on possible solutions. This approach emphasized learner autonomy, critical thinking, and the application of knowledge to real-world contexts. In contrast, the control group was taught using traditional teacher-led instruction. The instructional design in this group focused primarily on vocabulary explanations, direct text comprehension exercises, and question-answer drills. This method highlighted the teacher's role as the primary source of knowledge, with limited opportunities for collaboration or strategy development. To measure the impact of both instructional approaches, all participants completed a pre-test prior to the intervention, followed by the eight-week instructional period, and finally a post-test to evaluate changes in their reading comprehension performance.

To evaluate the effects of the intervention in Reading comprehension scores were analyzed using paired-sample t-tests (within groups) and ANCOVA (between groups, controlling for pre-test scores). Meanwhile, Engagement and reading strategies were analyzed using descriptive statistics and MANOVA to examine multivariate differences between groups.

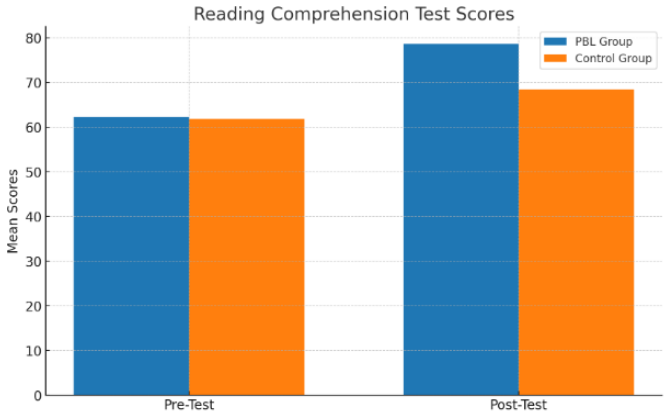
Result and Discussion

Reading Comprehension Test Scores

Table 1 presents the mean scores of the pre-test and post-test for both groups. The PBL group showed a remarkable improvement compared to the control group which can be seen in the following table.

Table 1. Pre-test and Post-test Reading Comprehension Scores

Group	N	Pre-test Mean (SD)	Post-test Mean (SD)	Gain Score	*p*-value
Control	35	62.40 (8.15)	65.10 (7.84)	+2.70	> .05
PBL (Experimental)	35	63.05 (7.96)	74.85 (8.23)	+11.80	< .001



Graph 1. Reading Comprehension Test Scores

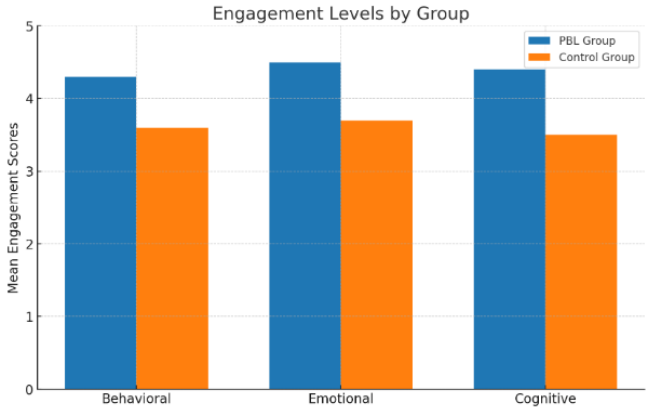
Table 1 demonstrates that while both groups exhibited some improvement from pre-test to post-test, the experimental group receiving PBL instruction achieved a significantly higher gain in reading comprehension scores compared to the control group. The control group's modest increase (+2.70) was not statistically significant, whereas the PBL group's substantial gain (+11.80) reached high statistical significance ($p < .001$). This suggests that PBL effectively enhanced students' comprehension skills beyond what was achieved through traditional instruction.

Student Engagement

Table 2 shows the engagement levels across behavioral, emotional, and cognitive domains. The PBL group reported consistently higher engagement compared to the control group.

Table 2. Levels of Student Engagement by Group

Engagement Dimension	Control Mean (SD)	PBL Mean (SD)	*p*-value
Behavioral Engagement	3.12 (0.56)	3.98 (0.48)	< .01
Emotional Engagement	2.95 (0.62)	3.85 (0.51)	< .01
Cognitive Engagement	3.08 (0.59)	4.02 (0.44)	< .001



Graph 2. Engagement Levels by Group

As shown in Table 2, the PBL group consistently outperformed the control group across all engagement dimensions. The largest difference emerged in cognitive engagement (Control = 3.08, PBL = 4.02), indicating that PBL fostered deeper mental effort and self-regulation during reading tasks. Emotional engagement was also notably higher in the PBL group (3.85 vs. 2.95), suggesting that PBL increased students' interest and enjoyment in the learning process. Behavioral engagement followed a similar trend. Collectively, these results indicate that PBL not only improved comprehension outcomes but also sustained students' motivation and active participation.

Reading Strategies

Table 3 presents the frequency of strategy use, measured on a 5-point Likert scale. The PBL group reported higher use of inferencing, summarizing, and questioning strategies than the control group.

Table 3. Reading Strategies Reported by Students

Reading Strategy	Control Mean (SD)	PBL Mean (SD)	*p*-value
Inferencing	3.02 (0.61)	3.88 (0.52)	< .01
Summarizing	2.85 (0.58)	3.91 (0.49)	< .001
Questioning	2.74 (0.63)	3.76 (0.55)	< .001
Rereading	3.72 (0.57)	3.45 (0.54)	> .05
Translation	3.64 (0.62)	3.28 (0.59)	> .05

Table 3 reveals significant differences in the types of strategies employed by the two groups. The PBL group reported significantly greater use of higher-order strategies such as inferencing ($p < .01$), summarizing ($p < .001$), and questioning ($p < .001$). In contrast, the control group relied more on basic strategies like rereading and translation, though these differences were not statistically significant. These findings suggest that PBL not only improved comprehension outcomes but also encouraged students to adopt more sophisticated and effective reading strategies.

Discussion

The present study set out to investigate the effectiveness of problem-based learning (PBL) in enhancing EFL students' reading comprehension, engagement, and strategy use. The findings consistently demonstrated that students exposed to PBL outperformed those in traditional instruction across all major dimensions. These results underscore the potential of PBL as a pedagogical approach to address persistent challenges in EFL reading classrooms.

Reading Comprehension Gains

The significant improvement in comprehension test scores among the PBL group, compared to the control group, highlights the effectiveness of problem-oriented tasks in facilitating deeper understanding of texts. Unlike traditional instruction, which often emphasizes teacher explanation and surface-level decoding, PBL situates reading within authentic contexts that require learners to critically analyze and synthesize information. This aligns with previous studies reporting positive effects of PBL on comprehension outcomes in EFL contexts (Hairuddin et al., 2018). Moreover, the statistically significant gain of +11.80 in the PBL group suggests that exposure to problem-driven discussions and collaborative meaning-making strengthens learners' interpretive and inferential abilities, which are essential for academic reading.

Student Engagement

The study also revealed that PBL significantly enhanced behavioral, emotional, and cognitive engagement. This finding is consistent with Fredricks et al.'s (2004) multidimensional framework of engagement, which emphasizes the interplay between active participation, affective involvement, and mental investment. The higher scores in cognitive engagement among PBL students suggest that the approach promoted self-regulation and critical thinking during reading tasks. Emotional engagement gains further imply that PBL increased students' intrinsic motivation and enjoyment, echoing previous research where authentic problem scenarios were found to spark learners' interest and persistence (Hung, 2016). Taken together, these outcomes suggest that PBL not only improves learning performance but also creates a more engaging and motivating classroom environment.

In addition to quantitative results, insights from student reflections further illustrated how PBL enhanced engagement. Several students expressed that working with real-world problems made reading activities feel more purposeful and motivating. One student reflected, "When we read the text about global issues, I felt like the reading was not just for answering questions but for solving something important with my group." Another wrote, "I usually get bored with long reading texts, but in PBL, I wanted to understand more because my friends depended on me to share ideas." These reflections indicate that engagement was not only behavioral, as shown through higher participation, but also deeply emotional and cognitive. Students perceived PBL tasks as relevant, collaborative, and challenging in ways that encouraged persistence, interest, and critical thinking. Such qualitative evidence complements the statistical findings, showing that learners experienced engagement as a dynamic process shaped by authenticity, accountability to peers, and enjoyment of problem-solving.

Reading Strategy Development

The differences in reported strategy use provide further evidence of the transformative role of PBL. Students in the experimental group reported significantly greater use of higher-order strategies such as inferencing, summarizing, and questioning, which are essential for constructing meaning from texts. In contrast, the control group continued to rely more on lower-order strategies such as rereading and translation, reflecting a more mechanical and less analytical approach to reading. These results align with (Sampini et al., 2021) emphasis on the importance of metacognitive and problem-solving strategies for effective comprehension. By embedding reading tasks within real-world problem contexts, PBL appears to push learners toward adopting deeper processing strategies, thereby improving both comprehension and transferability of skills.

Student reflections also revealed how PBL influenced their use of reading strategies. One student wrote, "Before, I only read and translated word by word, but in PBL I tried to summarize because we needed to present the main idea to the group." Another noted, "I started asking myself questions while reading, like 'why did this happen?' or 'what will happen next?'—it helped me understand the text better." Others mentioned that collaboration pushed them to adopt more active strategies, as one student reflected, "When my group discussed the text, I realized I had to make inferences so I could contribute something meaningful." These reflections suggest that PBL not only encouraged learners to move beyond mechanical strategies such as rereading or translation but also helped them consciously adopt higher-order strategies like

questioning, summarizing, and inferencing. The reflections therefore complement the quantitative findings, highlighting that strategy development was experienced as a deliberate and socially supported process.

The findings of this study lend support to constructivist theories of learning, which posit that knowledge is actively constructed through engagement with meaningful problems rather than passively received from the teacher (Hmelo-Silver, 2004). PBL's emphasis on inquiry, collaboration, and reflection provides a conducive environment for EFL learners to develop the skills necessary for higher-level comprehension. Pedagogically, this suggests that integrating PBL into EFL reading curricula may help address common limitations of traditional classrooms, such as low engagement, surface-level comprehension, and over-reliance on translation. Furthermore, the results encourage language instructors to incorporate authentic problem scenarios that require students to apply a range of reading strategies in order to arrive at solutions.

Despite the promising findings, several limitations should be acknowledged. The study was conducted with a relatively small sample size (N = 70) from a single institution, which may limit generalizability. The duration of the intervention (6–8 weeks) also raises questions about the long-term sustainability of the observed gains. Future research could employ larger samples across diverse contexts and extend the intervention period to examine the durability of PBL effects. Moreover, qualitative methods such as interviews or classroom observations could complement quantitative findings by providing deeper insights into learners' perceptions of PBL and their evolving reading strategies. Thus, this study provides strong evidence that problem-based learning significantly enhances EFL learners' reading comprehension, fosters greater engagement, and encourages the use of more effective reading strategies. By situating reading within authentic problem contexts, PBL helps move learners beyond surface-level processing toward deeper and more meaningful comprehension. These findings support the integration of PBL as a valuable pedagogical approach in EFL classrooms seeking to improve both cognitive and affective outcomes.

Conclusion

This study confirms that problem-based learning (PBL) is highly effective in improving EFL undergraduates' reading comprehension, classroom engagement, and use of strategies compared to traditional teacher-led instruction. Students taught through PBL demonstrated stronger abilities in identifying main ideas, making inferences, summarizing, and applying critical reading strategies such as questioning, analyzing, and synthesizing information. Beyond academic skills, PBL created a more active and collaborative learning environment that promoted learner autonomy, motivation, and cognitive engagement. These outcomes indicate that PBL functions as a holistic instructional approach, combining comprehension development with critical thinking and problem-solving, while also addressing affective aspects of learning. Based on these findings, it is recommended that PBL be more widely applied in EFL classrooms through authentic tasks, curriculum integration, and teacher training programs, with future research encouraged to investigate its long-term impact across various proficiency levels and learning contexts.

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