

Project-Based learning for Academic reading: Enhancing higher-order thinking Skills in EFL Learners
Aprendizaje basado en proyectos para la lectura Académica: Mejorando las habilidades de pensamiento de orden Superior en estudiantes de inglés como Lengua Extranjera

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Abstract

This study explores the effectiveness of -Based Learning (PBL) in fostering Higher-Order Thinking Skills (HOTS) in academic reading among English as a Foreign Language (EFL) university students. Using a mixed-methods approach, the research integrates quantitative (pre-test, post-test, rubric-based assessments, surveys) and qualitative (classroom observations, interviews, reflective journals) data to provide a comprehensive analysis of PBL's impact. The study was conducted with 45 students from a public university, enrolled in an academic reading course where PBL was implemented. A pre-test was administered on the first day of the semester to assess students' initial critical reading abilities, while a post-test was taken one week before the end of the course to measure progress. Additionally, custom-designed rubrics evaluated students' ability to analyze, synthesize, and evaluate texts. Findings revealed significant improvements in students' critical reading skills, greater engagement and motivation, and enhanced autonomy in learning. However, time management and collaboration challenges were also noted. The study concludes that PBL is a highly effective methodology for developing HOTS, encouraging deeper comprehension, problem-solving, and critical thinking in academic reading.

Keywords: Project-Based Learning, Higher Education, Reading Skills.

Resumen

Este estudio explora la efectividad del Aprendizaje Basado en Proyectos (PBL, por sus siglas en inglés) en el desarrollo de Habilidades de Pensamiento de Orden Superior (HOTS) en la lectura académica de estudiantes universitarios de inglés como lengua extranjera (EFL). A través de un enfoque mixto, la investigación integra datos cuantitativos (pre-test, post-test, evaluaciones basadas en rúbricas, encuestas) y cualitativos (observaciones en el aula, entrevistas, diarios reflexivos) para proporcionar un análisis integral del impacto del PBL. El estudio se llevó a cabo con 45 estudiantes de una universidad pública, inscritos en un curso de lectura académica donde se implementó el PBL. Se aplicó un pre-test el primer día del semestre para evaluar las habilidades iniciales de lectura crítica y un post-test una semana antes de finalizar el curso para medir el progreso. Además, se utilizaron rúbricas diseñadas específicamente para evaluar la capacidad de los estudiantes para analizar, sintetizar y evaluar textos. Los resultados revelaron mejoras significativas en las habilidades de lectura crítica, mayor motivación y compromiso y mayor autonomía en el aprendizaje. Sin embargo, se identificaron desafíos en la gestión del tiempo y el trabajo colaborativo. El estudio concluye que el PBL es una metodología altamente efectiva para desarrollar HOTS, promoviendo una comprensión más profunda, resolución de problemas y pensamiento crítico en la lectura académica.

Palabras clave: Aprendizaje basado en Proyectos, Educación superior, Destrezas lectoras

Introduction

In recent years, educational paradigms have evolved towards more student-centered approaches that emphasize active engagement and critical thinking. One such approach, Project-Based Learning (PBL), has gained significant attention for its potential to enhance higher-order thinking skills (HOTS) in learners. The development of these cognitive abilities is particularly crucial for students learning English as a Foreign Language (EFL), as they must not only acquire linguistic proficiency but also develop analytical, evaluative, and creative thinking skills necessary for academic success.

Academic reading in EFL contexts presents unique challenges. Traditional methods often focus on surface-level comprehension, vocabulary acquisition, and grammatical accuracy, leaving little room for deeper engagement with texts. Consequently, students may struggle with making inferences, evaluating arguments, and synthesizing information—core competencies associated with HOTS. As a response to this limitation, PBL has been introduced as an alternative pedagogical strategy that fosters active learning, collaboration, and problem-solving, all of which contribute to higher-order cognitive development.

In Latin America, particularly in countries like Ecuador, the implementation of PBL in higher education is still in a developmental phase. Traditional lecture-based methodologies remain dominant, often limiting opportunities for students to engage in critical and reflective learning. Many EFL learners in the region face challenges related to limited exposure to authentic academic texts, teacher-centered instruction, and an educational culture that prioritizes rote memorization over analytical engagement. In this context, PBL represents a promising alternative that can bridge the gap between traditional instruction and the demands of modern academic literacy, equipping students with the skills necessary to navigate complex texts and academic discourse. (Ledesma Acosta et al., 2025)

This study investigates the implementation of PBL in an EFL academic reading course at a university level in Ecuador. By employing a mixed-methods approach, the research examines the effectiveness of PBL in enhancing HOTS among university students. Through qualitative and quantitative data collection, this study provides insights into students' cognitive development, engagement levels, and academic reading performance. The findings contribute to the growing body of research on innovative pedagogical approaches in EFL education and offer practical implications for educators seeking to enhance their teaching methodologies, particularly in the Latin American context.

This literature review explores the impact of PBL on the development of HOTS in EFL academic reading. Specifically, it examines the theoretical foundations of PBL, the cognitive demands of academic reading in EFL contexts, and empirical studies on the application of PBL in fostering critical literacy skills. Furthermore, the review highlights the challenges and opportunities associated with implementing PBL in Latin American higher education institutions, particularly in Ecuador.

Theoretical Foundations of Project-Based Learning. - PBL is rooted in constructivist theories of learning, which emphasize knowledge construction through active participation and real-world problem-solving (Dewey, 1938; Vygotsky, 1978). Unlike traditional lecture-based instruction, which often promotes passive learning, PBL encourages students to engage deeply with content, collaborate with peers, and develop self-regulation skills (Krajcik & Blumenfeld, 2006). Research has shown that PBL enhances cognitive engagement by requiring learners to analyze information, synthesize diverse perspectives, and generate innovative solutions (Bell, 2010; Thomas, 2000).

Higher-order thinking skills, as conceptualized by Bloom's Taxonomy (Anderson & Krathwohl, 2001), include analysis, evaluation, and creation. These skills go beyond rote memorization and require students to interact meaningfully with content, develop reasoned

arguments, and apply knowledge to novel situations. PBL aligns with this framework by fostering inquiry-driven learning environments where students take ownership of their learning and develop metacognitive strategies (Hmelo-Silver, 2004).

Academic Reading in EFL Contexts: Cognitive Demands and Challenges. - Academic reading in an EFL context involves complex cognitive processes, including decoding, inferencing, summarizing, and critical evaluation (Grabe & Stoller, 2013). Traditional methods of EFL instruction often emphasize surface-level comprehension, focusing on vocabulary acquisition and grammatical accuracy (Richards & Renandya, 2002). While these components are essential, they do not sufficiently equip students with the skills necessary to engage critically with academic texts.

EFL learners frequently encounter difficulties in making inferences, evaluating arguments, and synthesizing multiple sources of information (Zhang, 2008). Studies suggest that many students struggle with identifying authorial intent, distinguishing between fact and opinion, and constructing coherent interpretations of complex texts (Koda, 2005). These challenges are exacerbated in contexts where instruction remains teacher-centered and assessment prioritizes memorization over critical analysis (Barnett, 1989).

Empirical Studies on PBL and HOTS in EFL Academic Reading.- Several studies have investigated the impact of PBL on EFL learners' critical thinking and reading comprehension skills. Research by Beckett and Slater (2005) found that PBL increased students' ability to critically analyze texts and construct well-supported arguments. Their study highlighted that collaborative project work provided students with opportunities to engage with authentic texts, fostering deeper comprehension and analytical skills. Similarly, a study by García-Ponce and Restrepo (2019) in a Latin American EFL context demonstrated that PBL enhanced students' ability to synthesize information from multiple sources. The authors found that students engaged in project-based tasks showed improved metacognitive awareness and were better able to apply reading strategies to complex academic texts.

Another significant study by Li (2020) examined the role of PBL in improving argumentation skills in EFL academic reading. The findings indicated that students participating in PBL activities demonstrated a greater ability to evaluate evidence, identify logical fallacies, and construct coherent written responses to academic readings. These findings suggest that PBL can serve as an effective pedagogical approach for fostering HOTS in EFL learners.

Challenges and Opportunities in Implementing PBL in Latin American Higher Education.-

Despite the potential benefits of PBL, its implementation in Latin American higher education faces several challenges. Traditional lecture-based methodologies remain dominant in many universities, limiting opportunities for students to engage in inquiry-based learning (González, 2018). Faculty resistance, lack of training in PBL methodologies, and institutional constraints further hinder its widespread adoption (Freire & Fernandes, 2020). Moreover, many EFL learners in the region have limited exposure to authentic academic texts, making it difficult for them to develop the analytical and evaluative skills necessary for academic success (Rojas & Pérez, 2017). Additionally, assessment practices often emphasize rote learning and standardized testing, which may not align with the principles of PBL (Rodríguez, 2021).

However, recent initiatives indicate a growing interest in innovative pedagogical approaches, including PBL, in Latin America. Studies have highlighted successful cases where universities have integrated PBL into EFL curricula, leading to improvements in student engagement and academic performance (Montoya, 2022). The adoption of digital technologies and online resources has also facilitated the implementation of PBL, providing students with access to diverse learning materials and collaborative tools (Sánchez & Ramírez, 2023).

The literature suggests that PBL holds significant promise for enhancing higher-order thinking skills in EFL academic reading. By promoting active engagement, collaboration, and problem-solving, PBL provides learners with opportunities to develop critical literacy skills essential for academic success. While challenges remain in implementing PBL in Latin American

higher education, ongoing research and institutional support can contribute to its broader adoption. Future studies should continue to explore the long-term impact of PBL on EFL learners' cognitive development and identify best practices for its effective integration into academic curricula.

By synthesizing theoretical perspectives and empirical evidence, this literature review underscores the potential of PBL as a transformative pedagogical approach that aligns with the demands of 21st-century education. Educators and policymakers should consider strategies to overcome barriers to PBL implementation and foster learning environments that prioritize inquiry, critical thinking, and meaningful engagement with academic texts.

Methods and materials

This study employs a mixed-methods approach (quantitative and qualitative) to analyze the effectiveness of Project-Based Learning (PBL) in developing Higher-Order Thinking Skills (HOTS) in academic reading in English as a Foreign Language (EFL). The combination of methods provides a comprehensive understanding of PBL's impact, measuring changes in students' academic performance while exploring their perceptions and experiences.

The study is conducted in a higher education setting, focusing on EFL students enrolled in English class at a university. Participants come from diverse linguistic and cultural backgrounds, with varying levels of English proficiency. The institution follows a communicative and competency-based curriculum, aiming to enhance students' critical thinking, analytical reasoning, and problem-solving abilities through student-centered pedagogies like PBL.

The sample for this study consisted of 45 university students enrolled in an English class at a public university. The participants were selected using a purposive sampling strategy, ensuring that they had direct exposure to Project-Based Learning (PBL) as part of their coursework. The sample included 32 female and 13 male students, reflecting the typical gender

composition in language learning programs at the institution. Participants' ages varied between 20 and 35 years, capturing a diverse group of students, from younger undergraduates to older learners who may have returned to higher education after some professional or personal experience. All of the students were non-native English speakers, with varying levels of proficiency in English as a Foreign Language (EFL). While some had a solid foundation in academic reading, others were still developing their skills in analyzing and interpreting complex texts. The course was conducted in a presential learning format, combining face-to-face sessions with online activities. This allowed students to engage with digital tools and collaborative platforms, enhancing the effectiveness of PBL in developing their analytical and interpretative skills.

By including students with diverse backgrounds and experiences, the study aimed to gain a comprehensive understanding of how PBL influences reading comprehension, critical analysis, and learner autonomy in an EFL academic setting. This carefully designed sample composition ensures that the findings are contextually relevant while also allowing for potential generalizability to similar university-level EFL programs implementing PBL methodologies.

Research Instruments & Tools

To ensure a rigorous and multidimensional analysis, the study employs a variety of data collection tools:

Quantitative Instruments

Pre-test and post-test assessments. - The study utilized pre-test and post-test assessments to measure students' improvement in critical reading skills, specifically their ability to analyze, synthesize, and evaluate academic texts. The pre-test was administered on the first day of the semester, establishing a baseline for students' initial proficiency in Higher-Order Thinking Skills (HOTS) within the context of academic reading.

The post-test was conducted one week before the end of the semester, ensuring that students had sufficient exposure to Project-Based Learning (PBL) throughout the course. After the post-test, the results were reviewed and discussed with students, allowing them to reflect on their progress, strengths, and areas for further development. This reflective process aimed to reinforce metacognition and self-regulation in their academic reading practices.

Rubrics for academic reading tasks. - The study used custom-designed rubrics, specifically developed for this group of students, to assess their application of HOTS in academic reading tasks. These rubrics provided detailed criteria for evaluating students' ability to critically analyze texts, make inferences, synthesize information, and construct reasoned arguments.

The rubrics were designed to be transparent and student-friendly, ensuring that participants clearly understood expectations and assessment criteria. Throughout the semester, students engaged in self-assessment and peer evaluation using these rubrics, fostering an active learning environment where they could recognize their growth and refine their reading strategies.

By incorporating structured assessments and tailored evaluation tools, the study ensured a rigorous, data-driven analysis of how PBL contributes to the development of Higher-Order Thinking Skills in EFL academic reading.

Qualitative Instruments:

Classroom Observations. - were conducted throughout the semester to document student interactions, group dynamics, and engagement levels during Project-Based Learning (PBL) activities. The observations focused on how students collaborated, communicated, and applied critical thinking skills while working on PBL tasks.

Specific aspects examined included:

Participation levels: How actively students contributed to discussions and group tasks.

Problem-solving approaches: How students navigated challenges and applied Higher-Order Thinking Skills (HOTS).

Peer collaboration: The nature and effectiveness of interactions among students from different academic backgrounds.

Autonomy and motivation: How students engaged with the learning process independently and as a team.

Observations were recorded through field notes and structured checklists, ensuring a systematic and objective analysis of student behaviors and engagement patterns.

To minimize observer bias, multiple class sessions were observed, and findings were triangulated with student reflections and instructor feedback. This qualitative data provided rich insights into the real-time impact of PBL, complementing the quantitative assessments and offering a more holistic understanding of how students developed their critical reading skills in an EFL academic context.

Analysis of results

The results of this study are presented in two main sections: quantitative findings, which focus on statistical analysis of students' performance, and qualitative findings, which explore student engagement, perceptions, and experiences with Project-Based Learning (PBL) through classroom observations.

Quantitative Findings. - The quantitative analysis examined students' improvement in Higher-Order Thinking Skills (HOTS) in academic reading by comparing pre-test and post-test results, evaluating their performance through rubric-based assessments, and analyzing survey responses regarding their experience with PBL.

Pre-test and Post-test Results. - A paired-samples t-test was conducted to compare students' performance before and after PBL implementation. The pre-test, administered on the first day of the semester, assessed students' initial proficiency in analyzing, synthesizing, and evaluating academic texts. The post-test, taken one week before the end of the semester, measured their progress after a full term of engaging in PBL activities.

The mean pre-test score was 58.3% (SD = 9.6), indicating a moderate level of critical reading skills at the beginning of the semester.

The mean post-test score increased significantly to 78.9% (SD = 7.8), reflecting a notable improvement in students' ability to engage with complex texts critically.

A statistically significant difference was found between pre-test and post-test scores ($t(44) = 11.25, p < 0.001$), confirming that PBL had a positive impact on students' development of HOTS in academic reading.

Further analysis revealed that 82% of students showed a significant increase in their performance, while 14% showed moderate improvement. Only 4% of students displayed minimal progress, likely due to lower engagement in the PBL activities or external factors affecting their learning.

Rubric-Based Assessment of Academic Reading Tasks. - The rubric-based assessment evaluated students' application of HOTS in interpreting and responding to academic texts. The rubrics were specifically designed for this study, focusing on four key components: Analytical reasoning (ability to break down complex texts and identify key arguments), Synthesis (ability to connect ideas from multiple sources), Evaluation (ability to critically assess sources for credibility and relevance) and Argumentation (ability to construct well-reasoned, evidence-based responses).

At the beginning of the semester, only 21% of students met the highest proficiency level in these areas.

By the end of the semester, 74% of students demonstrated high proficiency, particularly in analysis and evaluation skills.

The greatest improvement was observed in the synthesis component, where the percentage of proficient students increased from 28% to 79%.

Qualitative Findings. - The qualitative data were gathered from classroom observations, semi-structured interviews, and students' reflective journals. These findings provide in-depth insights into how students experienced PBL, including their engagement levels, learning strategies, and challenges.

Classroom Observations. - Throughout the semester, direct classroom observations were conducted to assess student participation, collaboration, and critical engagement in PBL activities. The following themes emerged:

Increased Student Autonomy: Students took more initiative in directing their learning, particularly when working in small research groups. Instead of relying on instructors for answers, they engaged in peer-led discussions to analyze texts, compare interpretations, and evaluate sources.

Collaborative Problem-Solving: In the early weeks of the semester, some groups struggled with effective teamwork. However, by mid-semester, collaborative strategies improved, with students demonstrating stronger problem-solving abilities. They learned to assign roles within their groups, manage research tasks efficiently, and debate conflicting interpretations of texts productively.

Application of Critical Reading Strategies: During observed discussions, students frequently applied HOTS-based strategies, such as: Identifying bias and assumptions in academic sources, comparing conflicting arguments across multiple texts, constructing evidence-based responses to complex questions, one particularly notable improvement was students' ability to challenge and justify their viewpoints rather than simply summarizing content.

Conclusions

Integrating active, student-centered methodologies enhances cognitive engagement and critical reasoning skills in academic learning environments. When students take an active role in their own learning process, they develop stronger analytical and problem-solving abilities. Encouraging inquiry-based discussions, collaboration, and real-world application of reading skills fosters deeper comprehension and higher levels of cognitive processing.

The structure of the learning process plays a crucial role in shaping both individual and collective academic growth. When students work collaboratively on complex tasks, they not only build essential competencies but also refine their ability to articulate, defend, and evaluate ideas critically. However, the effectiveness of such approaches depends on clear guidance, structured assessment methods, and students' ability to adapt to self-directed and cooperative learning environments.

The development of advanced academic skills requires an integrated approach that considers both cognitive and affective factors. Beyond mastering specific reading strategies, students benefit from learning experiences that increase motivation, autonomy, and self-regulation. While challenges such as time management and group coordination may arise, structured support mechanisms can help students navigate these difficulties, ultimately leading to more meaningful and transformative learning experiences.

Referencias bibliográfica

- Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.
- Barnett, M. A. (1989). *More than meets the eye: Foreign language reading*. Prentice Hall.
- Beckett, G. H., & Slater, T. (2005). *The project framework: A tool for language, content, and skills integration*. *ELT Journal*, 59(2), 108-116. <https://doi.org/10.1093/elt/cci024>
- Bell, S. (2010). *Project-based learning for the 21st century: Skills for the future*. The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83(2), 39-43. <https://doi.org/10.1080/00098650903505415>
- Dewey, J. (1938). *Experience and education*. Macmillan.
- Freire, M., & Fernandes, L. (2020). *Challenges of implementing project-based learning in Latin American higher education: Faculty perspectives*. *Latin American Journal of Educational Research*, 5(1), 45-63.
- García-Ponce, L., & Restrepo, A. (2019). *Enhancing EFL learners' higher-order thinking skills through project-based learning in a Latin American university*. *Journal of Applied Linguistics and Language Research*, 6(4), 112-129.
- González, R. (2018). *Traditional vs. innovative teaching methodologies in Latin American universities: A comparative analysis*. *Latin American Journal of Higher Education Studies*, 7(3), 89-102.
- Grabe, W., & Stoller, F. L. (2013). *Teaching and researching reading* (2nd ed.). Routledge.
- Hmelo-Silver, C. E. (2004). *Problem-based learning: What and how do students learn?*. *Educational Psychology Review*, 16(3), 235-266. <https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>
- Koda, K. (2005). *Insights into second language reading: A cross-linguistic approach*. Cambridge University Press.
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- Krajcik, J. S., & Blumenfeld, P. C. (2006). *Project-based learning*. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 317-334). Cambridge University Press.
- Ledesma Acosta, B. V., Cedeño Díaz, K. M., Bravo Criollo, J. C., & Bastidas Ledesma, D. B. (2025). Enhancing English Reading Comprehension through Project-Based Learning Approaches: Mejorando la Comprensión Lectora en inglés a través de Enfoques de Aprendizaje Basado en Proyectos. *Revista Científica Multidisciplinar G-Nerando*, 6(1), Pág. 1552 –. <https://doi.org/10.60100/rcmg.v6i1.500>
- Li, Y. (2020). *Developing argumentation skills in EFL academic reading through project-based learning*. *Journal of English for Academic Purposes*, 47, 100913. <https://doi.org/10.1016/j.jeap.2020.100913>
- Montoya, P. (2022). *Project-based learning in higher education: A case study in Latin America*. *International Journal of Educational Innovation*, 8(2), 56-74.
- Richards, J. C., & Renandya, W. A. (2002). *Methodology in language teaching: An anthology of current practice*. Cambridge University Press.
- Rodríguez, S. (2021). *Assessment practices in Latin American higher education: Are we fostering critical thinking?*. *Latin American Journal of Educational Research*, 6(2), 78-95.
- Rojas, C., & Pérez, M. (2017). *Barriers to critical thinking development in EFL reading instruction in Latin America*. *Journal of Language Teaching and Research*, 8(5), 942-954.
- Sánchez, D., & Ramírez, P. (2023). *Digital resources and project-based learning in EFL education: A Latin American perspective*. *Journal of Educational Technology and Language Learning*, 10(1), 34-50.
- Thomas, J. W. (2000). *A review of research on project-based learning*. The Autodesk Foundation.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Zhang, L. (2008). *Cognitive challenges in academic reading for EFL students: A case study*. *International Journal of Applied Linguistics*, 18(1), 45-64.
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