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Implementación de la plataforma digital de inteligencia artificial Microsoft Copilot en la comprensión lectora del idioma inglés en estudiantes de primer nivel del programa de Física

Implementation of artificial intelligence digital platform Microsoft Copilot in reading comprehension of english language at first level students of the Physics program

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RESUMEN

Introducción: La inteligencia artificial generativa puede apoyar la comprensión lectora en inglés mediante explicaciones de vocabulario, resúmenes y preguntas guiadas. La evidencia sobre Microsoft 365 Copilot en la educación superior latinoamericana sigue siendo limitada. Este estudio examinó la comprensión lectora y las percepciones y experiencias de estudiantes de Física de la ESPOCH, Ecuador. Metodología: Se aplicó un enfoque mixto secuencial explicativo con un componente preexperimental de un solo grupo, con pretest y postest, en 23 estudiantes de primer nivel durante ocho sesiones semanales. Se utilizaron una prueba de lectura de 30 ítems, un cuestionario Likert de 20 ítems y entrevistas semiestructuradas. Resultados: La media aumentó de 14,57 (DE = 2,35) a 20,74 (DE = 3,00), con una ganancia de 6,17 puntos, $t(22) = 18,03$, $p < 0,001$ y dz de Cohen = 3,76. La percepción global fue favorable (M = 81,78/100; DE = 7,31) y superó el valor de referencia de 60 (Wilcoxon W = 276; $p < 0,001$). Las entrevistas destacaron el apoyo al vocabulario, la interpretación, la confianza y la participación, junto con dificultades al formular instrucciones, problemas de conexión y preocupaciones sobre dependencia de la IA. Conclusiones: Copilot se percibió como recurso complementario útil. La mejora observada coincidió con la intervención, pero la ausencia de grupo de control impide establecer causalidad.

Palabras clave: Microsoft 365 Copilot; comprensión lectora en inglés; inteligencia artificial generativa; investigación de métodos mixtos; educación superior.

ABSTRACT

Introduction: Generative artificial intelligence may support English reading comprehension through vocabulary explanations, summaries, and guided questions. Evidence on the educational use of Microsoft 365 Copilot in Latin American higher education remains limited. This study examined reading-comprehension outcomes and students' perceptions and experiences in the Physics program at ESPOCH, Ecuador. Methodology: An explanatory sequential mixed-methods approach included a one-group pretest–posttest pre-experimental component with 23 first-level students across eight weekly sessions. A 30-item reading test assessed comprehension, a 20-item Likert questionnaire assessed perceptions, and semi-structured interviews explored experiences. Results: Mean reading scores rose from 14.57 (SD = 2.35) to 20.74 (SD = 3.00), a gain of 6.17 points, $t(22) = 18.03$, $p < .001$, Cohen's dz = 3.76. Overall perceptions were favorable (M = 81.78/100, SD = 7.31), with scores above the reference value of 60 (Wilcoxon W = 276, $p < .001$). Interview themes included vocabulary support, interpretation of difficult texts, confidence, engagement, prompt-writing challenges, connectivity, and concerns about dependence on AI. Conclusions: Copilot was perceived as a useful supplementary resource for English reading activities. The observed improvement coincided with the intervention; without a control group, a causal effect cannot be established.

Keywords: Microsoft 365 Copilot; english reading comprehension; generative artificial intelligence; mixed-methods research; higher education.

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1. INTRODUCCIÓN

Reading comprehension is a fundamental academic skill in higher education, as students are required to interpret textbooks, scientific articles, and technical materials, many of which are written in English (Septia et al., 2022). Academic reading involves understanding explicit information, interpreting vocabulary in context, identifying main ideas, drawing inferences, and critically evaluating textual information, all of which are essential for successful engagement with disciplinary knowledge. These processes often present challenges for English as a Foreign Language (EFL) learners, particularly when they encounter unfamiliar vocabulary, complex sentence structures, difficulties identifying main ideas, and limited experience with academic texts (Ramadhianti & Somba, 2023; Laily et al., 2026). Furthermore, a growing body of research has confirmed a strong relationship between vocabulary knowledge and reading comprehension, highlighting lexical competence as a key predictor of academic reading performance among EFL learners (Binhomran & Altalhab, 2023; Ait Hammou et al., 2025). Such challenges are particularly relevant in disciplines that require extensive engagement with specialized English-language materials, including science, technology, engineering, and mathematics (STEM) programs (Abdel Latif, 2025; Li, 2026). Consequently, developing effective strategies to support reading comprehension remains a priority in higher education.

The rapid advancement of Artificial Intelligence (AI), particularly Generative Artificial Intelligence (GenAI), is reshaping higher education by providing students with new opportunities to access information, receive personalized support, and engage in autonomous learning. In EFL education, GenAI tools can generate explanations of unfamiliar vocabulary, summarize texts, create practice activities, provide guided questioning, and deliver immediate feedback, thereby fostering interactive learning environments that support language development. Recent studies have highlighted the potential of AI-supported learning to enhance language proficiency, reading comprehension, vocabulary acquisition, learner engagement, and self-regulated learning (Kim, 2024; Purba et al., 2025; Kainta & Umarella, 2026; Razlan & Rahmat, 2026). Nevertheless, the educational benefits of these technologies depend not only on their technical capabilities but also on their meaningful pedagogical integration and the guidance provided by instructors (Balcı, 2024; Liu et al.,

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2025). Furthermore, AI-generated outputs require critical evaluation to ensure accuracy and reliability (Daweli & Mahyoub, 2024; Lin et al., 2025).

Despite the growing body of literature on AI-assisted language learning, research has predominantly focused on writing skills and the use of tools such as ChatGPT, while reading comprehension remains comparatively underexplored (Li et al., 2025; Deng & Jamaludin, 2026). Existing studies generally report positive educational outcomes but also raise concerns related to overreliance on AI, academic integrity, and the need for appropriate teacher supervision (Ali et al., 2025; El Hassan & Alsalwah, 2025). Moreover, most available evidence has been generated in East Asian and Middle Eastern contexts, leaving a notable gap in Latin American higher education.

Among emerging AI technologies, Microsoft 365 Copilot has attracted growing attention because it integrates conversational interaction, information retrieval, content generation, and adaptive learning support within a single platform. Through features such as vocabulary explanations, text summarization, guided questioning, and feedback generation, Copilot may facilitate students' interaction with academic texts while promoting active engagement in learning tasks. However, despite its increasing adoption in educational settings, empirical evidence regarding its effectiveness for enhancing English reading comprehension remains limited, particularly in Latin American higher education contexts. Consequently, further research is needed to examine both its impact on reading performance and its potential as a learning support tool.

The present study is grounded in constructivist and sociocultural learning theories, self-regulated learning, and the Technology Acceptance Model (TAM). From a constructivist perspective, learners actively construct knowledge through engagement with texts and learning tasks. Sociocultural theory emphasizes the importance of mediation and scaffolding in supporting learning processes, while self-regulated learning highlights learners' ability to plan, monitor, and evaluate their own learning. Complementing these perspectives, the Technology Acceptance Model posits that perceived usefulness and perceived ease of use are key determinants of technology adoption. Together, these frameworks provide a comprehensive basis for examining both the educational and experiential dimensions of Microsoft 365 Copilot-assisted reading instruction.

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To address this gap, the present study investigates the implementation of Microsoft 365 Copilot as a pedagogical support tool for developing English reading comprehension among first-level students in the Physics Program at ESPOCH, Ecuador. Using mixed-methods explanatory sequential design, the study examines changes in reading comprehension performance following an eight-week intervention and explores students' experiences with AI-assisted reading instruction. The independent variable is Microsoft 365 Copilot as an AI-supported digital platform, whereas the dependent variable is English reading comprehension. Accordingly, the study hypothesizes that the implementation of Microsoft 365 Copilot is associated with significant improvements in students' English reading comprehension.

2. METODOLOGÍA

- Research Design

This study employed an explanatory sequential mixed-methods design, in which quantitative data were collected and analyzed first, followed by qualitative data collection to provide a deeper understanding of the quantitative findings (Creswell & Plano Clark, 2018). The quantitative component followed a one-group pretest-posttest pre-experimental design to examine changes in English reading comprehension after the implementation of Microsoft 365 Copilot. In addition, students' perceptions of Microsoft Copilot were quantitatively assessed through a Likert-scale questionnaire. The qualitative component consisted of semi-structured interviews designed to explore students' experiences, perceptions, and reflections regarding the use of Microsoft Copilot during reading activities.

The integration of quantitative and qualitative evidence occurred during the interpretation stage through methodological triangulation. Quantitative findings from the reading comprehension test and the perception questionnaire were compared with qualitative evidence obtained from the semi-structured interviews to achieve a more comprehensive understanding of AI-assisted reading instruction. Because the study did not include a control group or random assignment, the findings are interpreted as improvements and perceptions associated with the intervention context rather than as evidence of direct causal effects.

- Research Context

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The study was conducted at the Escuela Superior Politécnica de Chimborazo (ESPOCH), a public university located in Riobamba, Ecuador. The intervention was implemented during the March–July 2026 academic term within a first-level English as a Foreign Language (EFL) course offered to students enrolled in the Physics Program.

The context was considered appropriate because Physics students regularly encounter scientific and technical information written in English and therefore require adequate reading comprehension skills to access disciplinary knowledge. During the intervention, Microsoft 365 Copilot was incorporated as a pedagogical support tool to assist students in vocabulary clarification, text interpretation, summarization, question generation, and comprehension monitoring.

- Participants and Sampling

The target population comprised students enrolled in the first level of the Physics Program at ESPOCH during the March–July 2026 academic term. A non-probability convenience sampling strategy was used because the study was conducted with the intact class accessible to the researchers. The final sample included 23 students (12 males and 11 females). Because all 23 students in the accessible cohort participated, the sample constituted a census of that cohort, rather than a census of all first-level Physics students across different academic periods. According to the study records, all 23 participants completed the pretest, posttest, perception questionnaire, and semi-structured interview activities. Therefore, eligibility criteria included: (a) enrollment in the first level of the Physics Program, (b) registration in the corresponding English course, (c) participation throughout the eight-week intervention, and (d) completion of all assessment instruments.

- Instruments

Three instruments were used to collect quantitative and qualitative data: (a) an English Reading Comprehension Test, (b) a Microsoft 365 Copilot Perception Questionnaire, and (c) a semi-structured interview protocol.

Content validity was examined through expert review by three specialists in Applied Linguistics, English language teaching, and educational assessment. The experts evaluated item relevance, clarity, representativeness, coherence, and alignment with the study objectives. Their feedback was used to revise wording and improve the instruments before the main data collection. Both the reading comprehension test and the perception

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questionnaire were piloted with 15 university students from a comparable EFL context who were not included in the final sample. Internal consistency was estimated using Cronbach's alpha, yielding $\alpha = .734$ for the reading comprehension test and $\alpha = .835$ for the perception questionnaire. These coefficients provide preliminary evidence of internal consistency; however, the small pilot sample limits the precision and generalizability of the estimates.

- English Reading Comprehension Test

Reading comprehension was assessed using a researcher-designed test comprising five reading passages and 30 multiple-choice items. The instrument covered literal comprehension, inferential comprehension, vocabulary in context, main idea identification, and critical comprehension. Each correct response was awarded one point (possible score: 0–30); higher scores indicated better reading comprehension. A pilot study with 15 students from a comparable setting yielded Cronbach's alpha = .734, providing preliminary evidence of internal consistency. Given the small pilot sample, this estimate should be interpreted cautiously (Taber, 2018).

- Microsoft 365 Copilot Perception Questionnaire

Students' perceptions of Microsoft 365 Copilot were measured using a researcher-developed questionnaire consisting of 20 items rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument assessed five dimensions: perceived usefulness, reading engagement, learning autonomy, digital literacy, and user satisfaction.

The instrument underwent expert review and was piloted with 15 students from a comparable EFL setting who were not part of the final sample. Cronbach's alpha was .835, suggesting internal consistency for the 20-item total scale in the pilot; the small number of pilot participants limits the precision of this estimate (Taber, 2018). The total score ranged from 20 to 100, and 60 was used as the theoretical scale midpoint. Results for individual dimensions were not analyzed separately in the reported findings.

- Semi-structured interviews

The semi-structured interview protocol contained eight open-ended questions addressing learning experiences, support for reading comprehension, perceived benefits and difficulties, and suggestions for future AI integration. All 23 participants were interviewed after the

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intervention. Interviews lasted approximately 15–20 minutes, were audio-recorded with consent, and were transcribed verbatim. The researchers applied the six-phase thematic analysis approach of Braun and Clarke (2006): familiarization, initial coding, identification of candidate themes, review, naming, and reporting. Inductive coding produced five themes: positive learning experiences; reading-comprehension and vocabulary support; perceived benefits of AI-assisted reading; challenges in AI-assisted reading; and recommendations for future integration.

Interview transcripts were read repeatedly and coded inductively. Related codes were grouped into candidate themes, compared across participants, and refined to produce the five themes reported in Table 4. Representative excerpts were selected to illustrate these patterns. Frequencies indicate the number of interviewees whose responses included each code; the codes are not mutually exclusive and the counts are descriptive, not separate measures of intervention effectiveness.

- Intervention and procedure

The intervention took place in the English I course from March 4 to April 22, 2026, comprising eight weekly sessions of two hours each (Table 1). Students accessed Microsoft 365 Copilot through institutional Microsoft 365 accounts on their computers or mobile devices. Each session combined teacher-guided reading with AI-supported vocabulary clarification, main-idea identification, inference, summarization, and critical interpretation. Students were asked to attempt tasks independently, compare AI-generated explanations with the source text, and discuss interpretations with the instructor. The first session introduced the platform and responsible use; the eighth included the posttest and perception questionnaire. Semi-structured interviews were completed following the instructional activities. The pretest was administered before the learning activities.

Throughout the intervention, students interacted with Microsoft 365 Copilot through structured prompts designed to support the development of the five reading comprehension dimensions assessed in the study: vocabulary in context, literal comprehension, main idea identification, inferential comprehension, and critical comprehension. The platform was used to clarify unfamiliar vocabulary, explain difficult passages, generate summaries, identify main ideas and key information, formulate comprehension questions, and provide feedback on students' understanding. Representative prompts included: "Explain the

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meaning of this word in context," "Summarize this paragraph using simple English," "Identify the main idea of this passage," and "Generate three comprehension questions based on this text."

All activities were progressively sequenced according to the course content and reading objectives, which are described in Table 1. Throughout the intervention, the professor supervised the use of Microsoft 365 Copilot, guided students in prompt formulation, verified AI-generated responses, and provided pedagogical support to ensure the appropriate integration of AI-assisted reading activities into the learning process.

Table 1.

Planning for Intervention in reading using Microsoft 365 Copilot

Week	Reading Topics Developed	Reading Comprehension Dimension(s)	Microsoft Copilot Activity	Prompt Applied
1 March 4, 2026	Introducing yourself, personal profiles, university life, student biographies	Vocabulary in Context	Introduction to Microsoft 365 Copilot, responsible AI use, vocabulary exploration, and guided reading support	"Explain the meaning of the highlighted words in this text and provide an example sentence for each word."
2 March 11, 2026	Daily schedules, university routines, time management, student activities	Vocabulary in Context; Literal Comprehension	Vocabulary clarification and identification of factual information in short reading passages	"Identify five key facts from this text about daily routines and explain the meaning of unfamiliar words."

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Week	Reading Topics Developed	Reading Comprehension Dimension(s)	Microsoft Copilot Activity	Prompt Applied
3 March 18, 2026	Famous scientists, professions, describing people, academic careers	Main Idea Identification; Vocabulary in Context	Guided reading focused on identifying main ideas, supporting details, and descriptive vocabulary	"Read this passage and identify the main idea and three supporting details."
4 March 25, 2026	Healthy eating habits, transportation systems, campus life, daily decisions	Literal Comprehension; Inferential Comprehension	Comprehension-question generation and interpretation of contextual information	"Generate three literal and three inferential comprehension questions based on this text."
5 April 1, 2026	Important life events, historical discoveries, memorable experiences, scientific milestones	Inferential Comprehension; Main Idea Identification	Summarization activities and identification of key events in narratives	"Summarize this text in five sentences and identify the most important event described by the author."
6 April 8, 2026	Short stories, biographies of physicists, introductory scientific articles	Inferential Comprehension; Critical Comprehension	Guided reading practice with teacher verification of AI-generated explanations	"What can be inferred from this passage that is not stated directly? Explain your reasoning."

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Week	Reading Topics Developed	Reading Comprehension Dimension(s)	Microsoft Copilot Activity	Prompt Applied
7 April 15, 2026	Basic physics concepts, scientific phenomena, technology and innovation, renewable energy	Critical Comprehension; Main Idea Identification	Analysis of technical vocabulary, evaluation of information, and comprehension monitoring	"Identify the main idea of this scientific text and evaluate whether the supporting information is sufficient and reliable."
8 April 22, 2026	Review and integration of all reading topics studied during the intervention	Literal Comprehension; Inferential Comprehension; Vocabulary in Context; Main Idea Identification; Critical Comprehension	Posttest and perception questionnaire; interviews following instructional activities	"Generate five comprehension questions that assess vocabulary, literal understanding, inference, main ideas, and critical interpretation of this text."

Note: Summary of the activities of intervention. Authors' Own elaboration

- Data Analysis

Quantitative analyses were conducted using jamovi, version 2.5 (The jamovi project, 2024). Descriptive statistics summarized reading scores and questionnaire totals. The paired-samples t-test assessed the reading-score change defined consistently as posttest minus pretest. The Shapiro–Wilk test of within-participant differences did not indicate a significant departure from normality ($W = .950$, $p = .297$). Consequently, the paired-samples t-test was used, with Cohen's dz as the standardized within-participant effect size. A Wilcoxon signed-rank test was reported as a complementary nonparametric check. Because the study had no comparison group, statistical significance does not establish causality.

For perception scores, the total questionnaire score (20–100) was compared with its theoretical midpoint (60). The one-sample Wilcoxon signed-rank test was used as the principal inferential analysis for the small sample and ordinal-response-based total score; a

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one-sample t-test and Cohen's d were calculated as complementary summaries from the reported mean, standard deviation, and sample size. The corresponding 95% confidence interval concerns the mean difference from 60, not the reading-score gain. The primary Wilcoxon analysis did not depend on an assumption that the questionnaire totals followed a normal distribution.

Interview data were analyzed as qualitative textual data using thematic analysis following the six-phase framework proposed by Braun and Clarke (2006). The analytical process involved: (a) familiarization with the data through repeated reading of interview transcripts; (b) generation of initial codes to identify meaningful data segments; (c) development of preliminary themes by grouping related codes; (d) review and refinement of themes to ensure internal coherence and distinctiveness; (e) definition and naming of themes to capture their central meaning; and (f) production of the final report through the integration and interpretation of thematic findings. This inductive approach enabled the identification of recurrent patterns and insights regarding participants' experiences and perceptions, providing a comprehensive understanding of the phenomenon under investigation.

Data integration was undertaken during the interpretation stage by comparing quantitative and qualitative evidence obtained from the reading comprehension test, perception questionnaire, and semi-structured interviews. The analysis focused on identifying areas of convergence across data sources to assess whether improvements in reading comprehension were reflected in students' perceptions and experiences with Microsoft 365 Copilot. In line with the explanatory sequential mixed-methods design, qualitative findings were used to explain and extend the quantitative results, thereby providing a richer and more comprehensive interpretation of the intervention's effects (Creswell & Plano Clark, 2018).

- Ethical Considerations

Prior to data collection, authorization was obtained from the Physics program coordinator at ESPOCH. All students were informed about the study's purpose, procedures, potential benefits and risks, confidentiality measures, and their right to withdraw at any time without academic consequences. Written informed consent was obtained from all participants before participation. To ensure confidentiality, participant data were securely managed, and interview transcripts were anonymized by removing identifying information and replacing it with alphanumeric codes (e.g., P1, P2, P3). These codes were used when reporting

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interview excerpts to prevent individual identification. Because the study was conducted within a regular classroom setting, participation in the research was clearly separated from course requirements and had no impact on students' grades or academic standing. Microsoft 365 Copilot was incorporated as a pedagogical support tool, and its use was guided by principles of responsible and ethical academic practice.

3. RESULTADOS

This section presents the findings obtained from the three data collection instruments used in the study: the English Reading Comprehension Test, the Microsoft Copilot Perception Questionnaire, and the Semi-Structured Interview. Consistent with the explanatory sequential mixed-methods design, quantitative results are reported first. These include students' reading comprehension outcomes measured through the pretest-posttest assessment and their perceptions of Microsoft 365 Copilot measured through a Likert-scale questionnaire. Subsequently, qualitative findings derived from the semi-structured interviews are presented to provide a deeper understanding of students' experiences, perceptions, and reflections regarding the use of Microsoft Copilot during reading activities. The section concludes with the triangulation of quantitative and qualitative evidence, integrating reading comprehension results, questionnaire responses, and interview data to provide a comprehensive understanding of the educational value of Microsoft 365 Copilot for English reading comprehension among first-level Physics students at ESPOCH.

- Reading comprehension

Reading-comprehension scores were compared for the 23 students who completed both measurements. With the paired difference defined as posttest minus pretest, the mean gain was 6.17 points (95% CI [5.46, 6.88]). The paired-samples t-test indicated higher scores at posttest, $t(22) = 18.03$, $p < .001$, with a very large standardized within-participant effect, Cohen's $dz = 3.76$. The mean increased from 14.57 (SD = 2.35) at pretest to 20.74 (SD = 3.00) at posttest (Table 2). These estimates describe change within the same group, not a causal effect of the platform.

Table 2.

Reading-Comprehension Descriptives and Paired-Comparison Tests

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Measure	Pretest	Posttest	Posttest − pretest / analysis
Participants (n)	23	23	23 paired observations
Mean	14.57	20.74	+6.17 points
Median	14.00	21.00	—
Standard deviation	2.35	3.00	—
Minimum–maximum	10–18	13–25	—
Shapiro–Wilk: paired difference	—	—	W = .950; p = .297
Paired-samples t-test	—	—	t(22) = 18.03; p < .001; Cohen's dz = 3.76; 95% CI [5.46, 6.88]
Wilcoxon signed-rank test	—	—	W = 276; p < .001; rank-biserial r = 1.00

Note. The contrast is posttest minus pretest throughout. The Shapiro–Wilk result refers to paired differences; the 95% confidence interval refers to the mean gain. Analyses were conducted in jamovi (version 2.5).

The Shapiro–Wilk test of paired difference scores (posttest minus pretest) indicated no statistically significant departure from normality, W = .950, p = .297. The Wilcoxon signed-rank test yielded a result consistent with the paired-samples t-test (W = 276, p < .001; rank-biserial correlation = 1.00). These concordant analyses support the finding of higher reading-comprehension scores at posttest. The absence of a control group prevents attribution of the observed gain exclusively to Microsoft 365 Copilot.

Overall, the findings are consistent with the research hypothesis, as reading comprehension scores were significantly higher at posttest than at pretest. The observed increase in scores suggests a positive pattern of change in students' English reading comprehension during the study period. However, given the one-group pretest-posttest design, the results should be interpreted as evidence of an association between the intervention period and improved reading comprehension outcomes rather than as proof of a causal effect attributable to Microsoft 365 Copilot.

- Students' perceptions of Microsoft 365 Copilot

All 23 participants completed the Microsoft 365 Copilot Perception Questionnaire. Scores ranged from 73 to 98 out of 100, with a mean of 81.78 (SD = 7.31) and a median

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of 79 (Table 3). These total scores were above the theoretical midpoint of 60, indicating favorable overall perceptions of the tool in this cohort. The reported results concern the questionnaire total; they do not establish favorable results separately for each of its five dimensions.

The mean item score for each participant ranged from 3.65 to 4.90 on the five-point response scale. Most students recorded total scores consistent with agreement with the positively worded questionnaire items. Since the minimum total score was 73, every participant's overall score exceeded the theoretical midpoint of 60.

The descriptive distribution suggests broadly favorable overall perceptions among the participating students. These self-reports reflect acceptance and perceived usefulness in the study setting, rather than independently measured educational benefits or results for individual questionnaire dimensions.

A one-sample Wilcoxon signed-rank test confirmed that total perception scores exceeded the theoretical midpoint of 60 ($W = 276$, $p < .001$; rank-biserial correlation = 1.00). As a complementary calculation based on the reported descriptive statistics ($n = 23$, $M = 81.78$, $SD = 7.31$), the one-sample t-test yielded $t(22) = 14.29$, $p < .001$, and Cohen's $d = 2.98$. The mean difference from 60 was 21.78 points, with an approximate 95% CI of [18.62, 24.94]. The parametric estimates are derived from rounded summary statistics; the Wilcoxon result does not require assuming a normal score distribution.

Together, the descriptive results and complementary tests indicate favorable overall perceptions of Microsoft 365 Copilot as a support resource for English reading activities among these 23 students. The results do not provide separate evidence for the perceived usefulness, reading engagement, learning autonomy, digital literacy, and satisfaction subscales.

Table 3.

Overall Perception Questionnaire Scores and One-Sample Tests

Measure	Total questionnaire score / analysis
Participants (n)	23
Possible score range	20–100
Mean	81.78
Median	79

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Measure	Total questionnaire score / analysis
Standard deviation	7.31
Minimum–maximum	73–98
Theoretical midpoint / reference	60
Mean difference from 60	+21.78 points
One-sample t-test (complementary)	t(22) = 14.29; p < .001; Cohen's d = 2.98; 95% CI for difference [18.62, 24.94]
One-sample Wilcoxon signed-rank test	W = 276; p < .001; rank-biserial r = 1.00

Note. The reference value is 60 on a 20–100 total-score scale. The t statistic, Cohen's d, and 95% confidence interval for the mean difference were recalculated from rounded summary statistics (n = 23, M = 81.78, SD = 7.31). The Wilcoxon result is reported as documented in the study analysis. Software: jamovi, version 2.5.

- Students' Experiences with Microsoft 365 Copilot

Semi-structured interviews were completed by all 23 participants and analyzed following Braun and Clarke (2006). Interview excerpts were anonymized using participant codes (P1–P23). Five related themes emerged: positive learning experiences, reading-comprehension and vocabulary support, perceived benefits, challenges, and suggestions for future integration. The perceived benefits and challenges are presented as separate themes in Table 4 to maintain a consistent thematic structure.

Table 4 presents descriptive code frequencies and representative excerpts for each of the five themes. Vocabulary clarification (n = 19), perceived improvement in reading comprehension (n = 18), and assistance with difficult passages (n = 16) were among the most frequently mentioned experiences. All 23 participants described a positive learning experience, although some also reported challenges in formulating effective prompts (n = 8), intermittent internet connectivity (n = 4), and concerns about dependence on AI (n = 4). The most common recommendation concerned prompt-writing instruction (n = 8). Counts describe coded interview responses and should not be interpreted as independent tests of effectiveness.

Table 4.

Interview Themes, Code Frequencies, and Representative Quotations

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Theme	Representative code	Frequency (n = 23)	Representative quotation
Positive learning experience with Microsoft 365 Copilot	Positive learning experience	23	"Using Copilot was a good experience because it helped me understand the readings more easily." (P4)
	Immediate support and feedback	9	"When I did not understand a word, Copilot answered immediately." (P12)
	Ease of use	5	"It was easy to use and I learned quickly how to ask questions." (P7)
	Clear explanations	6	"The explanations were simple and clear for my English level." (P15)
	Accessibility and availability	3	"I could use it whenever I needed help with the reading activities." (P21)
Reading-comprehension and vocabulary support	Vocabulary clarification	19	"Copilot explained new vocabulary and gave examples that helped me understand the meaning." (P2)
	Understanding difficult passages	16	"It helped me understand paragraphs that were difficult for me." (P10)
	Identification of main ideas	6	"Copilot helped me identify the main idea of the text." (P18)
	Text summarization	4	"The summaries made the readings easier to understand." (P5)

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Theme	Representative code	Frequency (n = 23)	Representative quotation
Perceived benefits of AI-assisted reading	Contextual explanations	8	"It explained words according to the context of the reading." (P14)
	Improved vocabulary knowledge	15	"I learned many new words and their meanings." (P8)
	Improved reading comprehension	18	"My understanding of English texts improved with Copilot's help." (P6)
	Increased confidence	8	"I felt more confident when answering reading questions." (P17)
	Faster reading processes	6	"I completed the activities more quickly because I received support immediately." (P1)
	Enhanced motivation	3	"The activities were more interesting and motivated me to read." (P22)
Challenges of AI-assisted reading	Difficulties creating prompts	8	"Sometimes I did not know how to ask the correct question." (P9)
	Internet connectivity issues	4	"The Internet connection occasionally interrupted my work." (P20)
	Excessively detailed responses	5	"Some answers were too long and difficult to read completely." (P11)

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Theme	Representative code	Frequency (n = 23)	Representative quotation
Recommendations for future AI integration	Dependence on AI tools	4	"I preferred not to depend too much on Copilot for every activity." (P16)
	No major difficulties reported	3	"I did not have significant problems using the tool." (P23)
	Prompt-writing training	8	"Students should receive training on how to write better prompts." (P13)
	More guided practice activities	4	"Teachers could include more guided activities using Copilot." (P3)
	Improved Internet access	3	"A more stable Internet connection would improve the experience." (P20)
	Balance between AI and independent reading	3	"Students should use Copilot as support, not as a replacement for reading." (P19)
	Continuing implementing Copilot	5	"I would like to continue using Copilot in future English courses." (P5)

Note. Frequencies are counts of participants mentioning each code (n = 23); multiple codes could be assigned to one interview. Quotations are anonymized. Source: authors' analysis of the interviews.

Overall, the findings presented in Table 4 indicate that participants viewed Microsoft 365 Copilot as a valuable support resource for English reading activities. The convergence of responses across the interviews suggests broad acceptance of AI-assisted learning, while also highlighting the importance of pedagogical guidance and adequate technological support for its effective integration into English language instruction.

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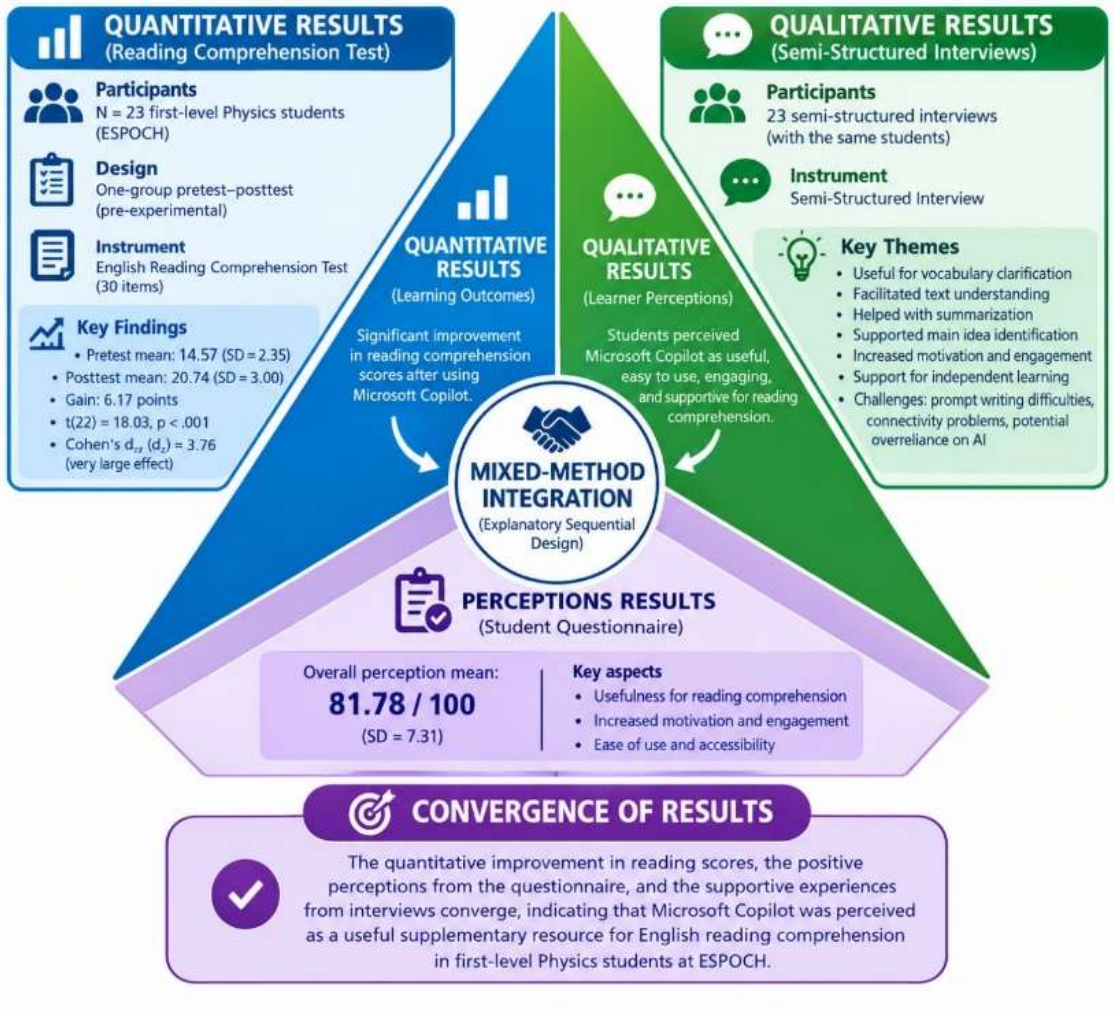
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· Mixed-Method Integration

The quantitative and qualitative findings showed complementary patterns. Figure 1 juxtaposes the increase in reading scores, the favorable global perception score, and students' reports of reading support. These findings provide preliminary convergent evidence regarding experiences during the intervention. Because the study lacked a control group, they cannot establish that Copilot alone caused the changes observed.

Figure 1

Integration of Quantitative and Qualitative Findings



Note. Figure summarizes the quantitative and qualitative findings of the present study. Source: authors' elaboration.

4. DISCUSIÓN

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This study examined the use of Microsoft 365 Copilot as a support tool for English reading instruction among first-year Physics students from ESPOCH, integrating evidence from reading comprehension outcomes, perception data, and students' learning experiences. The mixed-method findings revealed a consistent pattern whereby improved reading performance was accompanied by positive perceptions and favorable learning experiences, suggesting that students viewed Copilot as a valuable resource for supporting reading-related tasks.

Reading-comprehension scores were higher at posttest, with a large within-group standardized difference during the intervention period. The pre-experimental design prevents a causal interpretation, although the observed pattern is consistent with research reporting positive associations between generative AI-supported instruction, EFL reading development, and learner autonomy (Ali et al., 2025; Alrasheedi, 2025; Ironsi & Bostanci, 2026). Students frequently described Copilot as helpful for vocabulary clarification, understanding challenging passages, and identifying the main ideas of texts. These experiences contribute context-specific evidence from Ecuadorian higher education and STEM-oriented language learning.

Interview findings contextualized the quantitative results. Students described benefits involving confidence, engagement, reading efficiency, and independent learning. These accounts complemented the favorable global questionnaire scores without demonstrating that every questionnaire dimension was independently positive. Related research has identified possible roles for generative AI in learner engagement, self-directed learning, and reading support (Purba et al., 2025; Razlan & Rahmat, 2026).

From a pedagogical perspective, the results suggest that AI-supported reading activities may provide useful scaffolding for vocabulary development, text interpretation, summarization, inferencing, and comprehension monitoring. This interpretation aligns with findings reported by Hemmati (2026), Ironsi and Bostanci (2026), and Lin et al. (2025). Furthermore, the positive experiences reported by Physics students indicate that AI-assisted reading instruction may be particularly valuable in STEM contexts, where learners frequently encounter complex scientific and technical texts. However, several challenges also emerged, including difficulties in formulating effective prompts, connectivity issues, excessively detailed responses, and concerns about potential dependence on AI. Consistent with Liu et al. (2025) and Tuncer and Hopcan (2025), these findings suggest that the

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educational value of generative AI depends not only on access to technology but also on AI literacy, critical evaluation skills, and appropriate pedagogical support. Accordingly, teacher guidance, prompt-writing instruction, and the critical assessment of AI-generated responses appear essential for effective implementation (Addiucci & Temperini, 2026; Hemmati, 2026).

The results can be interpreted through several theoretical perspectives. From a sociocultural viewpoint, Microsoft 365 Copilot functioned as a mediational tool that supported learners during reading activities, reflecting the scaffolding processes described by Vygotsky (1978). Likewise, students' increased confidence and independent use of explanations are consistent with principles of self-regulated learning, which emphasize learners' active management of cognitive and metacognitive processes (Zimmerman, 2002). Furthermore, the favorable perception scores and recurring references to usefulness and accessibility are consistent with the Technology Acceptance Model (Davis, 1989), according to which perceived usefulness and ease of use facilitate technology adoption.

An additional contribution of this study lies in its contextual and disciplinary focus. Existing research on generative AI for language learning has been conducted primarily in Asian, Middle Eastern, and European contexts (Hemmati, 2026; Ironsi & Bostanci, 2026; Lin et al., 2025). Evidence from Latin American higher education remains comparatively limited, particularly regarding EFL reading instruction and STEM populations. By documenting reading outcomes, student perceptions, and learning experiences in an Ecuadorian university context, this study broadens the geographical scope of AI-assisted language-learning research. Moreover, unlike many previous studies involving general EFL populations, the present research focused on first-year Physics students, thereby contributing to emerging work on AI-supported language learning in STEM education.

Several limitations should be acknowledged. The absence of a control group and random assignment limits the ability to attribute improvements exclusively to Microsoft 365 Copilot. In contrast, previous studies by Lin et al. (2025), Ironsi and Bostanci (2026), and Hemmati (2026) employed quasi-experimental designs with comparison groups, providing stronger evidence regarding intervention effectiveness. The relatively small sample size and the use of a single institutional cohort also restrict the generalizability of the findings. Additionally, the eight-week duration of the intervention does not permit conclusions regarding

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the long-term sustainability of the observed gains. Finally, students' difficulties with prompt formulation indicate that AI literacy remains an important area for development.

Future studies should employ experimental or quasi-experimental designs with larger and more diverse samples, as well as longitudinal approaches capable of evaluating the sustained effects of Microsoft 365 Copilot and other generative AI tools on reading comprehension, learner autonomy, and language development. Future research should also examine how prompt-engineering instruction and AI literacy training influence learning outcomes, as suggested by Addiucci and Temperini (2026) and Davila-Moran et al. (2025).

Overall, the convergence of reading comprehension gains, positive perceptions, and interview evidence suggests that Microsoft 365 Copilot served as a useful supplementary resource for English reading instruction. The findings indicate that its potential benefits are associated with vocabulary support, comprehension assistance, and increased learner confidence. However, the successful educational integration of generative AI appears to depend on structured pedagogical guidance, responsible use practices, and the development of students' AI literacy and prompt-design skills.

5. CONCLUSIÓN

In this group of 23 first-level Physics students, reading-comprehension scores were higher after the eight-session instructional period in which Microsoft 365 Copilot was used as a supplementary resource. The mean gain was 6.17 points on a 30-point test (posttest minus pretest), and both paired-samples and nonparametric analyses indicated a statistically significant difference. These results describe within-group change and cannot demonstrate that Copilot caused the improvement.

The perception questionnaire yielded a favorable overall score (M = 81.78/100), while interviews highlighted vocabulary clarification, understanding difficult passages, confidence, and engagement. Students also described difficulties with prompt formulation and internet access, as well as concerns about overdependence on AI. The questionnaire results were analyzed at the total-score level, so conclusions about each of its five dimensions are not warranted. Taken together, the findings support considering Copilot as a supplementary aid rather than a substitute for instructor guidance and independent reading.

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The convergence of higher posttest scores, favorable global perceptions, and accounts of useful reading support provides a coherent interpretation of the students' experiences. Nonetheless, these data were collected within one small institutional cohort and without a control group; neither generalizability nor causal effectiveness can be inferred from the present design.

Further research should include comparison groups, larger and more diverse samples, and longer follow-up periods to evaluate whether observed improvements persist and can be attributed to AI-supported instruction. Studies could also examine how training in responsible AI use, prompt formulation, and critical evaluation of generated explanations influences reading outcomes.

In university EFL courses, structured use of generative AI may help students access unfamiliar vocabulary, summarize technical texts, and assess their interpretations. In STEM settings, its use should be accompanied by teacher feedback, verification against original sources, and opportunities to complete reading tasks without AI assistance.

The results suggest practical value in integrating Microsoft 365 Copilot into teacher-supervised reading activities while maintaining clear expectations concerning academic integrity and independent learning. Replication with stronger research designs is necessary before making broader claims about its effectiveness.

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CONFLICTO DE INTERESES

None.

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Not applicable.

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