Polo del Conocimiento

La influencia del aprendizaje en línea en los estudiantes de inglés en la universidad: efectos de las estrategias cognitivas y cooperativas

The influence of online learning on English learners in college: effects of cognitive and cooperative strategies

A influência da aprendizagem online em estudantes de inglês na faculdade: efeitos de estratégias cognitivas e cooperativas

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Resumen

Este estudio explora el impacto de las estrategias instruccionales cooperativas y cognitivas en el rendimiento académico de los estudiantes en cursos de inglés completamente en línea a nivel universitario. En respuesta a la rápida expansión de la educación digital—particularmente durante y después de la pandemia—los educadores han recurrido cada vez más a plataformas virtuales para impartir enseñanza del idioma. A pesar de su adopción generalizada, persiste la necesidad de datos empíricos sobre la eficacia de estas estrategias en entornos virtuales. Se llevó a cabo un estudio cuasi-experimental de seis semanas con 42 estudiantes de pregrado matriculados en un programa de inglés en línea. Los participantes completaron una prueba diagnóstica estandarizada (pre-test y post-test) alineada con los estándares del nivel B1 del MCER, y participaron en módulos semanales que integraban actividades de aprendizaje cooperativo, estrategias cognitivas de lectura, herramientas gamificadas (como Quizizz y Duolingo), y tareas tanto sincrónicas como asincrónicas. Los resultados de una prueba t para muestras relacionadas mostraron una mejora estadísticamente significativa en los puntajes del post-test ($t(41) = 10.998$, $p < .001$), con el 83.3% de los estudiantes demostrando avances moderados a significativos. Si bien la mayoría de los estudiantes se beneficiaron de la intervención, una minoría mostró progresos limitados o negativos, lo que sugiere la importancia del apoyo diferenciado y de la preparación tecnológica. Estos hallazgos ofrecen perspectivas prácticas para el diseño de la enseñanza del inglés en línea y refuerzan la necesidad de una planificación pedagógica estratégica en contextos digitales.

Palabras clave: Enseñanza de inglés en línea; aprendizaje cooperativo; estrategias cognitivas; entornos virtuales de aprendizaje; evaluación lingüística.

Abstract

This study explores the impact of cooperative and cognitive instructional strategies on students' academic performance in fully online college-level English courses. In response to the rapid expansion of digital education—particularly during and after the pandemic—educators have increasingly turned to virtual platforms for language instruction. Despite their widespread adoption, there remains a need for empirical data on the effectiveness of these strategies in virtual settings. A six-week quasi-experimental study was conducted with 42 undergraduate students enrolled in an online English program. Participants completed a standardized diagnostic test (pre- and post-test) aligned with CEFR B1 standards and engaged in weekly modules that integrated

Rosa María Chicaiza Chicaiza, Esperanza Monserrate Heredia Mendoza, Teresa Elizabeth Schettini
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cooperative learning activities, cognitive reading strategies, gamified tools (such as Quizizz and Duolingo), and both synchronous and asynchronous assignments. The results of a paired-samples t-test showed a statistically significant improvement in posttest scores (t (41) = 10.998, p < .001), with 83.3% of students demonstrating moderate to significant gains. While the majority of students benefited from the intervention, a minority showed limited or negative progress, suggesting the importance of differentiated support and technological preparation. These findings offer practical insights for the design of online English language instruction and reinforce the need for strategic pedagogical planning in digital contexts.

Keywords: Online English language instruction; cooperative learning; cognitive strategies; virtual learning environments; linguistic assessment.

Resumo

Este estudo explora o impacto de estratégias de ensino cooperativas e cognitivas no desempenho académico dos alunos em cursos de inglês de nível universitário totalmente online. Em resposta à rápida expansão da educação digital — particularmente durante e após a pandemia — os educadores têm recorrido cada vez mais a plataformas virtuais para o ensino de línguas. Apesar da sua ampla adoção, ainda há necessidade de dados empíricos sobre a eficácia destas estratégias em ambientes virtuais. Foi realizado um estudo quase experimental de seis semanas com 42 estudantes de licenciatura inscritos num programa de inglês online. Os participantes realizaram um teste de diagnóstico padronizado (pré e pós-teste) alinhado com os padrões CEFR B1 e participaram em módulos semanais que integravam atividades de aprendizagem cooperativa, estratégias de leitura cognitiva, ferramentas gamificadas (como Quizizz e Duolingo) e tarefas síncronas e assíncronas. Os resultados de um teste t para amostras emparelhadas mostraram uma melhoria estatisticamente significativa nas pontuações do pós-teste (t (41) = 10,998, p < 0,001), com 83,3% dos alunos a demonstrarem ganhos moderados a significativos. Embora a maioria dos alunos tenha beneficiado da intervenção, uma minoria apresentou progressos limitados ou negativos, sugerindo a importância de um apoio diferenciado e de uma preparação tecnológica. Estes resultados oferecem insights práticos para o design do ensino online de inglês e reforçam a necessidade de um planeamento pedagógico estratégico em contextos digitais.

Palavras-chave: Ensino online de inglês; aprendizagem cooperativa; estratégias cognitivas; ambientes virtuais de aprendizagem; avaliação linguística.

Introduction

The global advancement of digital technologies has redefined the landscape of education, enabling new ways of accessing, delivering, and interacting with knowledge. Virtual learning environments have evolved from supplementary tools into central components of formal education systems. As societies become increasingly interconnected, the demand for flexible, technology-driven instruction continues to grow, particularly in response to crises such as the COVID-19 pandemic, which exposed the vulnerabilities and possibilities of remote education (Dhawan, 2020). The shift has required not only infrastructure development but also a critical rethinking of pedagogical approaches that prioritize student engagement, autonomy, and equity in access.

In higher education, the adoption of online learning platforms has become both a necessity and an opportunity. Universities worldwide have implemented Learning Management Systems (LMS), videoconferencing, and a broad range of digital tools to support academic continuity. However, this transition has not been without its challenges. While digital tools offer flexibility, they also raise concerns about student motivation, teacher readiness, assessment validity, and disparities in digital literacy (Kebritchi, Lipschuetz, & Santiague, 2017). There is increasing evidence that online learning can produce meaningful outcomes, but its effectiveness heavily depends on the pedagogical strategies employed and the ability of educators to adapt these strategies to a virtual environment (Bawa, 2016).

Language education, particularly the teaching of English as a foreign language (EFL), presents specific demands within the context of online learning. English instruction requires the active development of communicative competencies, frequent interaction, and the integration of multiple modalities such as speaking, listening, reading, and writing. In virtual settings, the absence of physical cues, spontaneous peer interaction, and immediate feedback can hinder these processes. Nevertheless, the strategic use of digital tools—such as multimedia platforms, gamified learning, and synchronous collaboration—has the potential to bridge these gaps and even enhance certain aspects of learning when applied intentionally (Martínez-Pérez, 2020).

Despite the proliferation of online English courses and digital platforms, empirical studies examining their measurable impact on student academic performance remain limited. Much of the existing research focuses on qualitative perceptions or general effectiveness, leaving a gap in quantitative analyses that assess specific outcomes through robust statistical methods. Moreover,

while cooperative learning has shown promise in fostering communicative competence in digital classrooms (Fontes Guerrero et al., 2019), its concrete impact on academic achievement in English courses delivered fully online remains underexplored. Understanding how strategic pedagogical interventions—particularly those grounded in cognitive and cooperative frameworks—can affect student performance is critical for informing practice in this rapidly evolving educational context. This study seeks to address that gap by investigating the influence of online learning environments on the academic performance of university students enrolled in English language courses. Specifically, it examines whether the implementation of cooperative and cognitive strategies in a virtual classroom leads to statistically significant improvements in student outcomes. The research aims to provide empirical evidence to support best practices in online English instruction and to offer practical recommendations for educators seeking to enhance learning outcomes in digital contexts. The central research question guiding this study is: *Does the application of cooperative and cognitive strategies in an online learning environment significantly improve student performance in university-level English courses?*

Theoretical Framework *(Expanded)*

Cooperative Learning and Its Virtual Implementation

Cooperative learning remains one of the most effective strategies for fostering interaction, shared responsibility, and communicative development among learners in English language instruction. Research by Johnson and Johnson (1989) emphasized five essential elements for successful cooperative learning: positive interdependence, individual accountability, promotive interaction, social skills, and group processing. In online environments, these elements can be operationalized through collaborative tools such as forums, breakout rooms, peer editing activities, and digital projects. Fontes Guerrero, González Agulló, and Martínez García (2019) found that when cooperative strategies are guided properly in virtual classrooms, they not only enhance linguistic competence but also build students' cognitive autonomy and motivation for language use.

However, one of the main limitations in applying cooperative learning online lies in uneven student participation and technological disparities. When some students lack stable internet connections or are unfamiliar with digital tools, group dynamics may suffer. Additionally, the teacher's role in monitoring and scaffolding cooperation becomes more complex without in-person cues (Kagan, 1995).

Cognitive Strategies in Online Reading Comprehension: State of the Art and Delimitations

The development of reading comprehension in online learning environments requires the use of cognitive strategies such as predicting, questioning, clarifying, and summarizing. These strategies support learners in navigating complex texts, making inferences, and retaining key information (Afflerbach, Pearson, & Paris, 2008). Casas Paya (2017) demonstrated that explicit training in cognitive reading strategies led to improved comprehension performance among university students learning English as a foreign language.

Nevertheless, the current state of research is limited in several ways. First, most studies focus on classroom-based instruction with face-to-face support, leaving a gap in understanding how these strategies function in asynchronous or independent online environments. Second, there is a lack of robust experimental designs measuring learning outcomes through pre- and post-tests, especially with the use of inferential statistics. Finally, studies often overlook how digital distractions, user interface design, and content overload may affect the effectiveness of these strategies in virtual spaces.

Metacognition and Self-Regulation in Online Learning

Metacognitive strategies are essential for student success in virtual settings, where the ability to monitor and adjust one's own learning becomes a key determinant of achievement. According to Zimmerman (2002), effective learners engage in planning, monitoring, and evaluating their cognitive processes—a behavior especially crucial in self-paced and asynchronous learning environments. In online English instruction, metacognitive prompts, digital learning diaries, and goal-setting tools can guide students toward more reflective and strategic engagement with content (Fontes Guerrero et al., 2019).

Despite its recognized importance, metacognition is still under-integrated into most digital language learning platforms. Many course designs focus on content delivery and assessment rather than fostering learner autonomy and reflection. Incorporating self-regulatory scaffolds such as learning checklists, self-assessment rubrics, and feedback loops can lead to deeper and more autonomous learning but are rarely implemented at scale (Kebritchi et al., 2017).

Gamification and Motivation in Virtual Language Learning

Gamification refers to the application of game design elements—such as points, badges, leaderboards, and quests—to non-game contexts like education. In English language learning, gamified environments can increase motivation, engagement, and time-on-task, particularly among digital-native students (Muntean, 2011). Tools such as Quizizz, Duolingo, and Kahoot! have been widely adopted due to their capacity to make learning more interactive and rewarding.

However, the effectiveness of gamification depends heavily on its alignment with learning objectives. Superficial use of gamified elements may lead to extrinsic motivation without enhancing deeper understanding or skills. Moreover, research evaluating long-term academic outcomes in gamified EFL settings remains limited and mostly descriptive.

Blended Learning and the Flipped Classroom Approach

Blended learning combines online and face-to-face instruction, allowing students to engage with materials independently before applying knowledge in synchronous or collaborative sessions. The flipped classroom, a specific model of blended learning, has been effective in language instruction by moving grammar explanations and vocabulary introductions outside class time, and devoting live sessions to practice and interaction (Lo & Hew, 2017).

Although these models offer clear benefits, their implementation in fully online contexts—where no in-person component is available—presents challenges. The flipped approach relies on students coming prepared, which in asynchronous environments is difficult to monitor. Additionally, without immediate clarification or peer support, students may struggle with complex concepts introduced independently.

Task-Based Language Teaching (TBLT) in Online Environments

Task-Based Language Teaching (TBLT) is a communicative approach in which students complete meaningful tasks using the target language. TBLT encourages real-world language use, problem-solving, and student-centered learning. Online platforms can support TBLT through collaborative writing, simulated dialogues, and multimedia presentations (Ellis, 2003).

Still, the effective application of TBLT in online environments requires careful scaffolding. Instructors must ensure that digital tools support interaction, provide authentic input, and allow for outcome evaluation. Research on TBLT online remains underdeveloped and often focuses on tool effectiveness rather than pedagogical outcomes.

Digital Platforms, Gamification, and Online Learning Environments

The use of digital platforms has become central to modern language instruction, especially in fully online programs. These platforms—such as Moodle, Google Classroom, and Edmodo—facilitate structured content delivery, real-time communication, and personalized feedback. They allow instructors to organize modules, monitor progress, and integrate multimedia resources that enhance language acquisition (Kebritchi, Lipschuetz, & Santiague, 2017). The design of these platforms, and the extent to which they promote interaction, significantly influences student engagement and academic outcomes.

Within these platforms, gamification has emerged as a pedagogical trend aimed at increasing learner motivation and persistence. Tools such as Quizizz, Duolingo, and Kahoot have gained popularity for their ease of use and ability to create engaging, competitive learning environments (Muntean, 2011). These applications incorporate elements like immediate feedback, scoring systems, badges, and leaderboards to simulate gaming experiences. In English language learning, they are especially useful for vocabulary building, grammar practice, and comprehension checks. However, while gamified tools increase extrinsic motivation and student enjoyment, studies have shown that their impact on long-term learning depends heavily on instructional alignment and purposeful integration into lesson objectives (Lo & Hew, 2017).

One pedagogical model that complements the digital learning landscape is the flipped classroom. In this approach, students access instructional content—such as grammar explanations or vocabulary videos—outside of class time, often through asynchronous tools like pre-recorded lectures or reading assignments. Class time (or its virtual equivalent) is then used for interactive practice, problem-solving, and clarification of doubts (Bergmann & Sams, 2012). In the context of online English instruction, the flipped model allows instructors to focus synchronous sessions on communication skills, peer interaction, and personalized feedback. However, the success of this model depends on student responsibility and access to resources, as well as on the teacher's ability to design and sequence content effectively.

The distinction between synchronous and asynchronous learning environments is also fundamental to understanding the dynamics of virtual language instruction. Synchronous learning involves real-time interaction between students and teachers through video conferencing tools such as Zoom, Microsoft Teams, or Google Meet. It provides immediate feedback and fosters a sense of community, which is essential for developing oral skills in English. Conversely, asynchronous

learning offers students flexibility and autonomy through discussion forums, recorded materials, quizzes, and independent tasks. Both formats have strengths and limitations. Synchronous environments promote engagement and accountability but require stable connectivity and scheduling, while asynchronous environments allow for self-paced learning but may lead to isolation or procrastination without proper scaffolding (Hrastinski, 2008).

Combining these modalities in a blended or hybrid model can provide the benefits of both, but such integration requires careful instructional design, appropriate tool selection, and a deep understanding of learner needs and technological constraints. As the digital ecosystem of language education continues to evolve, educators must balance pedagogical rigor with innovation, ensuring that tools and methods serve the ultimate goal of meaningful, effective learning.

Methodology

Research Design

This study employed a quantitative, quasi-experimental design with a pre-test and post-test approach, aimed at measuring the effects of online pedagogical strategies on student performance in English language learning. The quasi-experimental nature of the research is due to the absence of random group assignment; instead, a single intact group of students was observed before and after the instructional intervention. This design allowed the researchers to assess whether there was a statistically significant difference in academic performance as a result of implementing specific teaching strategies within an online learning environment (Creswell & Creswell, 2018).

Participants

The participants were 42 undergraduate students enrolled in English courses at a public university in Ecuador. All participants were engaged in a fully online learning modality, due to institutional regulations following the post-pandemic shift to virtual education. The students were in their second or third academic year and had previously completed at least one online English course. Their ages ranged from 19 to 25, and they possessed basic to intermediate digital competencies, as verified by a preliminary self-assessment survey. Informed consent was obtained from all participants, and ethical considerations were observed throughout the study.

Instruments

To measure academic performance, a standardized achievement test in English was developed, consisting of 40 multiple-choice and open-ended items assessing grammar, vocabulary, reading

comprehension, and short writing tasks. The test was aligned with the B1 level of the Common European Framework of Reference for Languages (CEFR). A pre-test was administered in Week 1 before the intervention, and a post-test with equivalent difficulty and structure was conducted in Week 6. The reliability of the test was calculated using Cronbach's alpha, yielding a coefficient of 0.84, indicating high internal consistency.

Procedure

The research procedure was implemented over a six-week instructional period and included three key phases: diagnostic (Week 1), intervention (Weeks 2–5), and final assessment (Week 6). Each phase involved specific activities designed to collect data and apply pedagogical strategies in a structured and measurable manner. The entire study was conducted using the institutional Learning Management System (Moodle) and synchronous sessions via Zoom.

Phase 1: Diagnostic and Pre-Test (Week 1)

During the first week, the students were introduced to the study's objectives and provided with a digital informed consent form to voluntarily participate. After consent was obtained, two key instruments were administered:

1. **Pre-Test:**

A diagnostic test composed of 40 items was uploaded to Moodle. The test covered:

- o Grammar and vocabulary (20 multiple-choice items),
- o Reading comprehension (10 open-ended and multiple-choice items),
- o Short writing tasks (10 points, rubric-based evaluation).

The test was programmed with a 60-minute time limit and taken under controlled conditions via the LMS to reduce external assistance. Automated grading was applied to the objective sections, while instructors evaluated the open-ended and writing sections using an analytical rubric based on CEFR B1 descriptors.

2. **PerceptionSurvey:**

To assess students' initial attitudes, confidence, and habits related to online English learning, a Likert-scale questionnaire was applied. The survey included 15 items grouped in three dimensions:

- o **Motivation and engagement** (e.g., "I feel motivated when learning English through online platforms."),

o   **Use of digital tools** (e.g., "I am comfortable using applications such as Kahoot, Quizizz, or Duolingo."),

o   **Self-regulation and autonomy** (e.g., "I usually complete English tasks without needing reminders.").

Each item was rated on a 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The survey was anonymous and embedded in Moodle using the feedback activity module. Reliability was verified post hoc with Cronbach's alpha = 0.87, indicating high internal consistency.

Phase 2: Pedagogical Intervention (Weeks 2–5)

The instructional phase was designed around four weekly modules, each incorporating cognitive and cooperative strategies. The thematic content was aligned with students' syllabus and covered:

- **Week 2**: Reading strategies and collaborative summaries.
- **Week 3**: Grammar in context using Quizizz and peer-correction of written tasks.
- **Week 4**: Vocabulary development through Duolingo and small-group discussions.
- **Week 5**: Listening and speaking practice with Kahoot, oral recordings, and peer feedback.

Each week included:

- **Asynchronous activities**: Readings, videos, quizzes, writing tasks.
- **Synchronous sessions**: Zoom classes with breakout rooms for group work and discussion, typically 90 minutes per week.
- **Follow-up tasks**: Forum participation and short self-assessment using guided questions.

Instructors monitored completion, participation, and engagement through Moodle activity logs and qualitative observations in synchronous sessions.

Phase 3: Post-Test and Final Perception Survey (Week 6)

In the final week:

1. **Post-Test:** A parallel version of the diagnostic test was administered, equal in format and difficulty to the pre-test. It followed the same structure and timing, and results were compared to determine learning gains.

2. **Final Survey:** A second Likert-scale questionnaire was given, mirroring the first but adding items on satisfaction and perceived improvement (e.g., "I believe the use of

gamified tools helped me improve my English skills."). This allowed for pre- and post-intervention comparison in student perceptions, in addition to academic results.

Tabla 1. Comparison of Pre-Test and Post-Test Scores Among Online English Learners (N = 42)

Category	Score Difference Range	Number of Students	% of Total	Interpretation
Significant Improvement	+6.0 to +9.7	16	38.1%	High learning gain after intervention
Moderate Improvement	+3.0 to +5.9	19	45.2%	Meaningful progress with moderate gain
Minimal/No Change	-0.2 to +2.9	5	11.9%	Stable or small learning improvement
Negative Change	-2.9 to -1.0	2	4.8%	Performance decreased after intervention

Note. *Data were collected from 42 undergraduate students enrolled in a fully online English course. Differences represent the change in individual scores from a standardized pre-test to a post-test administered six weeks later after pedagogical intervention.*

Graphic 1. Distribution of Students by Level of Score Improvement After Online Instruction
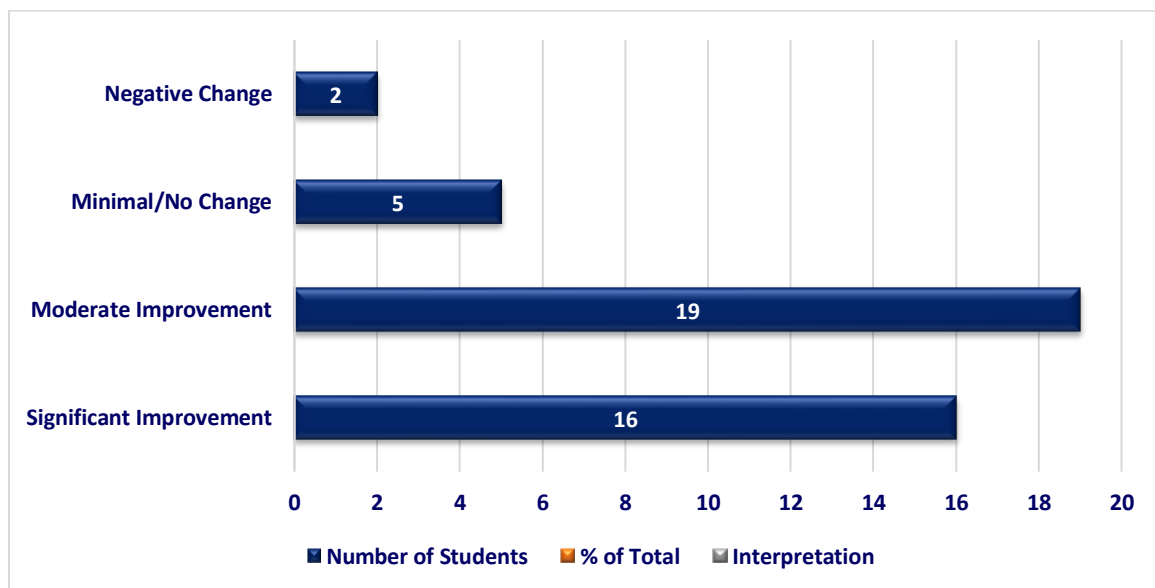
Interpretation by Category

1. Significant Improvement (38.1%)

Sixteen students showed a gain of 6 points or more in their post-test scores compared to the pre-test. These learners benefited strongly from the cognitive and cooperative strategies applied through the LMS. Many of them scored in the upper quartile in the final test, suggesting that the intervention not only supported but also accelerated their learning.

2. Moderate Improvement (45.2%)

Nineteen students improved between 3.0 and 5.9 points. This is the largest group, indicating that nearly half of the students made solid progress. Their improvement supports the effectiveness of structured online instruction and consistent formative assessment.

3. Minimal or No Change (11.9%)

Five students had little to no improvement (score changes between -0.2 and +2.9). This suggests that either the instructional strategies had limited effect for them, or that external factors such as motivation, attendance, or digital literacy influenced their outcomes.

4. Negative Change (4.8%)

Two students experienced a decline in performance. It's worth investigating whether these cases were due to non-academic reasons (e.g., technical issues, attendance gaps, or personal challenges) or an indication that the intervention did not meet their learning needs.

Results

The primary objective of this study was to determine whether the application of cooperative and cognitive strategies in a fully online English language course would lead to measurable improvements in student performance. To address this, a pre-test/post-test design was implemented over a six-week instructional period.

The guiding research question was: Does the application of cooperative and cognitive strategies in an online learning environment significantly improve student performance in university-level English courses?

To answer this question, descriptive and inferential statistics were applied. Table 2 presents the mean scores and standard deviations for the pre-test, post-test, and score difference.

Table 2: Descriptive Statistics for Pre-Test, Post-Test, and Score Difference

Statistic	Pre-Test	Post-Test	Difference
Mean	63.36	69.23	5.87
Standard Deviation	5.21	5.84	3.34

The data show an average improvement of 5.87 points following the pedagogical intervention. The standard deviation of the score differences was 3.34, indicating a moderate variation in individual student gains.

To test the significance of this improvement, a paired-samples t-test was conducted. The results revealed a highly significant difference between the pre- and post-test scores: $t(41) = 10.998$, $p < .001$.

This statistical evidence supports the hypothesis that the integration of cooperative and cognitive strategies in an online learning environment has a significant and positive impact on student learning outcomes. The low p-value ($< .001$) strongly suggests that the observed improvements were not due to chance, but rather to the effect of the instructional strategies applied during the intervention.

These findings align with the theoretical framework that emphasized the importance of structured interaction, cognitive scaffolding, and metacognitive regulation in digital learning environments. The results also confirm the relevance of the research question and provide empirical support for the stated objectives.

Discussion

The results of this study confirm that the implementation of cooperative and cognitive strategies in a fully online English learning environment significantly improved students' academic performance. The findings, supported by a statistically significant increase in post-test scores ($t(41) = 10.998$, $p < .001$), suggest that structured pedagogical interventions in virtual settings can yield outcomes comparable to, or even surpassing, traditional classroom-based instruction when carefully designed and executed.

These results are consistent with previous research by Fontes Guerrero et al. (2019), who emphasized that cooperative learning in online EFL classrooms promotes communicative competence, learner autonomy, and higher-order thinking. The positive impact observed in this

1607

study reinforces the value of social interaction, even in mediated environments, where peer collaboration fosters motivation and deepens engagement with language tasks.

Additionally, the integration of **cognitive strategies**—such as summarizing, predicting, and inferencing—likely contributed to the improvement in reading comprehension and written production, which were key components of the assessment instrument. This aligns with the findings of Casas Paya (2017), who demonstrated that explicit instruction in cognitive strategies enhances comprehension skills among university EFL learners.

The application of **gamified tools** such as Quizizz and Duolingo, combined with peer feedback activities, may also have played a role in increasing learner motivation and task commitment. As noted by Muntean (2011), gamification improves student engagement, and in this study, it appeared to support both learning outcomes and student satisfaction, as reflected in the post-intervention perception surveys.

However, the results also reveal variation in individual student performance. While the majority showed moderate to significant gains, a small percentage (4.8%) experienced a decline. These cases may be explained by factors such as digital fatigue, low intrinsic motivation, technological limitations, or insufficient adaptation to autonomous learning. This highlights the importance of providing **differentiated support**, especially in asynchronous learning environments where instructor oversight is more limited (Hrastinski, 2008).

Another critical insight from this study is the role of **self-regulation and metacognitive awareness**, as emphasized by Zimmerman (2002). The most improved students were those who actively engaged with weekly tasks, responded to feedback, and demonstrated consistency in participation. This underscores the necessity of embedding metacognitive scaffolds—such as reflective journals, learning checklists, and self-assessment rubrics—into digital curricula.

In summary, this discussion highlights the pedagogical value of intentional strategy-based instruction in online English courses. The evidence points to the effectiveness of blending cognitive and cooperative methods within digital platforms to foster not only academic achievement but also learner autonomy and satisfaction.

Conclusions and Recommendations

Conclusions

This study set out to evaluate the effectiveness of cooperative and cognitive pedagogical strategies within a fully online English language learning environment at the university level. Through the implementation of a six-week intervention and the analysis of pre- and post-test results, the findings demonstrate a statistically significant improvement in student performance, confirming the initial hypothesis that structured online strategies can meaningfully enhance learning outcomes.

The average increase of 5.87 points in academic performance, supported by a highly significant t-test result ($t(41) = 10.998$, $p < .001$), provides robust evidence that students benefited from the integration of interactive, reflective, and task-based methodologies. The combination of synchronous engagement, asynchronous tasks, and the use of gamified and collaborative tools contributed to a dynamic and student-centered virtual learning experience.

Furthermore, the study underscores the critical role of metacognitive regulation and learner autonomy in digital contexts. Students who engaged consistently, reflected on their learning, and interacted meaningfully with their peers tended to show the most substantial progress.

While the results are highly encouraging, they also reveal areas that require continued attention. A small group of students did not experience the same level of improvement, which may reflect the need for differentiated instructional approaches and enhanced digital support mechanisms. Additionally, technological limitations and varying levels of digital literacy continue to pose challenges in fully online instruction.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. **Pedagogical Integration of Strategies**: Educators should incorporate cooperative and cognitive strategies intentionally into online English courses. Activities should be designed to promote interaction, reflection, and real-world language use.

2. **Balanced Use of Synchronous and Asynchronous Tools**: A blended virtual model that combines real-time instruction with self-paced tasks can maximize engagement and accommodate diverse learning preferences.

3. **Utilization of Gamified Learning Platforms**: Tools such as Quizizz, Duolingo, and Kahoot should be integrated as formative assessment tools to enhance motivation and reinforce content.

4. **Metacognitive Scaffolding**: Teachers should embed metacognitive supports—such as learning journals, checklists, and reflective prompts—within the online curriculum to foster student self-awareness and autonomy.

5. **Ongoing Teacher Training**: Continuous professional development is needed to help instructors design, implement, and assess strategy-based instruction effectively in digital environments.

6. **Future Research**: Further studies should explore the long-term impact of online instructional strategies on language retention, and investigate how individual learner differences (e.g., motivation, digital competence) mediate learning outcomes in virtual environments.

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