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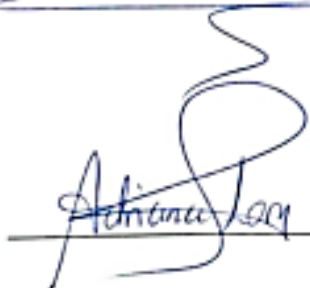
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Dedictory

I dedicate this research, first and foremost, to my beloved Jesus, who gave me the strength to persevere and achieve my goals, guiding my path even in the most difficult moments. I also dedicate it to my sister Cinthia, for her unconditional love and guidance, for being my emotional support in times of pain and loneliness, and for becoming my inspiration throughout every semester; to my mother Carmita, for always being present in my education and for instilling in me a deep love for Jesus; and to my sister Lisbeth, for her spiritual guidance and constant faith throughout this journey. Finally, to Joaquín Sánchez, for being part of this process and for showing me the joy of teaching young children.

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GENERAL INDEX

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Acknowledgements

Jahaira Nicole Lema Gavidia

GENERAL INDEX

LIST OF TABLES

LIST OF FIGURES

RESUMEN

ABSTRACT

CHAPTER I. INTRODUCTION	14
1.1 Introduction	14
1.2 Problem Statement.....	15
1.2.1 Statement of the Problem	15
1.2.2 Problem Formulation.....	16
1.3 Objectives	17
1.3.1 General Objective	17
1.3.2 Specific Objectives	17
2. CHAPTER II. THEORETICAL FRAMEWORK.....	17
2.1 State of the Art.....	17
2.2 Theoretical Foundation.....	18
2.2.1 Theoretical Support	18
2.2.2 Teaching English Grammar.....	21
2.2.3 Digital Tools in Education.....	23
2.2.4 English as a Foreign Language (EFL) Approaches.....	24
2.2.5 Learner-Centered Approach	25
2.2.6 Task-Based Learning (TBL).....	25

2.2.7	Digital Literacy Instruction.	25
2.2.8	Technology-Enhanced Learning (TEL).....	26
2.2.9	Digital Assessment through ICT	26
2.2.10	Effectiveness of Digital Tools in Academic Performance.....	27
2.2.11	Free Digital Tools for Grammar Learning.....	28
2.2.12	Students' Perceptions and Learning Experience	30
2.2.13	Activities Applied Within the Intervention Pedagogical Phase.....	31
3.	CHAPTER III. METHODOLOGY	32
3.1	Research Approach.....	32
3.2	Research Modality	32
3.3	Research Design and Type	32
3.4	Data Collection Techniques and Instruments	33
3.5	Study Population	34
3.6	Sample Size	35
3.7	Methods of Data Analysis and Processing	35
3.8	Ethical Considerations.....	36
4.	CHAPTER IV. RESULTS AND DISCUSSION.....	37
4.1	Analysis of Free Digital Tools for Teaching English Grammar	37
4.1.1	Digital Tools Analysis Checklist.....	37
4.2	Analysis of the Impact of Digital Tools on Students' Performance.....	41
4.2.1	Pretest and Posttest Results Comparison.....	41
4.2.2	Hypothesis Verification.....	43
4.3	Analysis of Students' Perceptions of Digital Tools for Grammar Learning .	45
4.4	Discussion.....	46
4.5	Limitations of the research work	48
5.	CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS.....	49
5.1	Conclusions	49

5.2	Recommendations	49
BIBLIOGRAPHY.....		50
ANNEXES.....		57

LIST OF TABLES

Descriptive Statistics of Digital Tools Analysis Checklist.....	37
Descriptive Statistics for Pretest and Posttest.....	41
Wilcoxon Signed-Rank Test Results.....	43
Participant’s Perceptions of Free Digital Tools in Learning English Grammar.....	45

LIST OF FIGURES

Distribution of LearnEnglish Grammar Criteria	38
Distribution of BBC Learning English Criteria.....	39
Distribution of English Grammar in Use Criteria	40
Increase Comparison for Pretest and Posttest Means	41
Box Plot of Graphical Analysis of Posttest and Pretest	44
Distribution of Learner’s Perceptions of Digital Tools in Learning English Grammar	45

RESUMEN

El presente estudio investigó la efectividad de las herramientas digitales gratuitas para la enseñanza de la gramática del inglés en estudiantes de primer semestre de la Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros de la Universidad Nacional de Chimborazo (UNACH) durante el período académico 2025–2S. El enfoque metodológico fue cuantitativo, con un diseño preexperimental basado en la comparación de un pretest y un postest. La muestra estuvo conformada por 20 estudiantes seleccionados mediante un muestreo no probabilístico por conveniencia. Los instrumentos utilizados fueron una lista de verificación de herramientas digitales, un cuestionario de percepción estudiantil y pruebas de gramática. Las herramientas analizadas fueron LearnEnglish Grammar (British Council), BBC Learning English y English Grammar in Use (Cambridge University Press). Los resultados evidenciaron mejoras significativas en el rendimiento académico de los estudiantes, con un incremento porcentual relativo del 107% en la media entre el pretest y el postest. Asimismo, los participantes reportaron percepciones altamente positivas respecto al uso de estas plataformas, destacando mayor confianza, flexibilidad y motivación en el aprendizaje gramatical. Se concluye que la integración de herramientas digitales constituye un recurso pedagógico efectivo para el desarrollo de la competencia gramatical en contextos universitarios de inglés como lengua extranjera.

Palabras claves: herramientas digitales, enseñanza de gramática, inglés como lengua extranjera, rendimiento académico, aprendizaje móvil, educación superior.

ABSTRACT

This study investigated the effectiveness of free digital tools for teaching English grammar to first-semester students enrolled in the Pedagogy of National and Foreign Languages program at the Universidad Nacional de Chimborazo (UNACH) during the 2025–26 academic period. A quantitative methodological approach was applied, using a pre-experimental design based on a pretest-posttest comparison. The sample consisted of 20 students selected through non-probabilistic convenience sampling. The instruments used included a digital tools checklist, a student perception questionnaire, and grammar tests. The tools analyzed were LearnEnglish Grammar (British Council), BBC Learning English, and English Grammar in Use (Cambridge University Press). The results demonstrated significant improvements in students' academic performance, with a 107% increase in the mean score between the pretest and posttest. Furthermore, participants reported highly positive perceptions regarding the use of these platforms, highlighting increased confidence, flexibility, and motivation in grammar learning. It is concluded that the integration of digital tools represents an effective pedagogical resource for developing grammatical competence in university-level English as a Foreign Language (EFL) contexts.

Keywords: digital tools, grammar teaching, English as a foreign language, academic performance, mobile learning, higher education.

CHAPTER I. INTRODUCTION

1.1 Introduction

Digital tools have become essential resources in English language learning, providing students with opportunities to practice grammar and improve their linguistic skills through interactive activities. In the context of foreign language learning, motivation plays a critical role, as students must continuously engage with new linguistic structures and communicative situations. For this reason, it is important to equip learners with tools and resources that inspire them and strengthen their learning orientation, particularly in grammar, which remains one of the most challenging components of language acquisition. Nevertheless, with the advancement of technology, new digital tools have emerged that offer more dynamic, interactive, and accessible ways to support both teaching and learning processes, gradually transforming traditional grammar instruction into a more engaging and effective experience (Mustakim, Jaya, & Jabri, 2025).

For this reason, the present research focused on the use of digital tools in the teaching and learning of English grammar. Preliminary classroom observations and academic surveys suggested that many students showed a lack of interest in grammar learning, particularly when exposed only to traditional, teacher-centered methods. This situation made it necessary to identify and analyze the most effective free digital platforms that could help teachers deliver grammar lessons more engagingly and efficiently. Among the tools examined were LearnEnglish Grammar (British Council), BBC Learning English (British Broadcasting Corporation), and English Grammar in Use (Cambridge University Press). These applications are widely available, mobile-accessible, and provide immediate feedback, making them valuable resources for enhancing grammar instruction in higher education contexts (Wah & Hashim, 2021).

The main objective of this study was to evaluate the effectiveness of digital tools in the teaching of English grammar, as grammar continues to be a fundamental element in second language acquisition. The research was conducted with first-semester students of the Pedagogy of National and Foreign Languages program at the *Universidad Nacional de Chimborazo* (UNACH) during the academic period 2025–2S. Understanding how students responded to these digital tools allowed educators to adapt their teaching methods and integrate technology more effectively into their classes.

This thesis is structured into six chapters. Chapter I includes the statement of the problem, the justification, and the general and specific objectives of the study. Chapter II presents the theoretical framework, including research background, key theories, and the operationalization of variables. Chapter III describes the methodological design, specifying the quantitative research approach, population and sample, data collection instruments, and techniques used for analysis. Chapter IV presents and interprets the results obtained from the study, using graphs and tables to illustrate findings. Chapter V includes conclusions and recommendations for improving grammar teaching practices. Finally, Chapter VI presents the pedagogical proposal derived from the findings of this research, along with the bibliography and annexes that support the entire research process. In essence, this study identified effective digital tools for grammar instruction, evaluated their impact on students' grammatical competence, and explored their perceptions of these resources. The study is relevant to improving grammar learning in higher education, was feasible due to the availability of the required resources, benefits both students and teachers, and contributes to the understanding of the role of digital tools in English language learning.

1.2 Problem Statement

1.2.1 Statement of the Problem

English is widely recognized as an essential tool for communication in today's globalized society, with grammar serving as a fundamental pillar to ensure accuracy and clarity in this process. Recent evidence suggests that the development of grammatical competence improves significantly when learners take an active role and utilize digital resources that foster autonomy and self-paced learning (Romero & Recalde, 2025). Consequently, the incorporation of technology into English language teaching has become increasingly relevant as a complementary strategy to support grammar instruction and language development.

Free digital tools such as LearnEnglish Grammar (British Council), BBC Learning English (British Broadcasting Corporation), and English Grammar in Use (Cambridge University Press) have progressively been integrated into educational environments as pedagogical resources for grammar learning. These platforms provide interactive exercises, accessibility, and immediate feedback, which are considered essential factors for strengthening grammatical accuracy and long-term language retention. Therefore, this study

focuses on two main variables: the use of selected digital tools and the development of English grammatical competence.

Despite the pedagogical potential of these resources, first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH) frequently face difficulties in applying English grammatical structures in real-life situations. Many learners demonstrate gaps in the practical use of complex grammatical rules, which limit their academic progress and motivation during the initial stages of their preparation as future language educators. Although digital resources are increasingly used in language instruction, limited empirical evidence exists regarding their effectiveness and impact on grammatical performance in Ecuadorian higher education contexts (Wah & Hashim, 2021).

Given this situation, it is necessary to determine whether the systematic integration of interactive digital tools can effectively improve grammatical proficiency and positively influence students' engagement in their own learning process. For this reason, the study aims to evaluate the educational value of incorporating these digital applications into English instruction and to determine whether they contribute to transforming grammar learning into a more dynamic and practical experience.

To address this issue, the study was conducted during the 2025–2S academic period with first-semester students from the Pedagogy of National and Foreign Languages program at *Universidad Nacional de Chimborazo* (UNACH). The research evaluated the effectiveness of selected digital tools as supporting resources for the development of English grammatical competence.

1.2.2 Problem Formulation

How effective are digital tools in supporting the teaching of English grammar to first semester students in the Pedagogy of National and Foreign Languages program at *Universidad Nacional de Chimborazo* (UNACH), during the academic period 2025–2S?

1.3 Objectives

1.3.1 General Objective

- To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at *Universidad Nacional de Chimborazo (UNACH)*, during the academic period 2025-2S.

1.3.2 Specific Objectives

- To analyze selected and widely used free digital tools for teaching English grammar, including as LearnEnglish Grammar, BBC Learning English, and English Grammar in Use.
- To evaluate the impact of implementing these digital tools, such as LearnEnglish Grammar, BBC Learning English, and English Grammar in Use, on students' academic performance by comparing their results before and after their use.
- To assess students' perceptions regarding the use of digital tools as support in learning English grammar.

2. CHAPTER II. THEORETICAL FRAMEWORK

2.1 State of the Art

The integration of digital tools in English grammar teaching has become increasingly relevant as educators seek to connect traditional instruction with modern technologies. In this regard, Beltrán (2017) and Cuesta and Grados (2017) emphasize that grammar learning is an active process supported by interaction, reflection, and autonomy, particularly in Mobile-Assisted Language Learning (MALL) environments. In line with this perspective, Mei et al. (2018) and Palomino (2020) also argue that digital platforms combining teacher guidance and peer collaboration promote motivation and grammatical retention, reinforcing the pedagogical value of interactive learning environments.

Similarly, Salvatierra and Kelly (2023) and Papi et al. (2019) report that scaffolded digital instruction enriched with peer feedback increases grammatical accuracy and student participation. Complementing these findings, Iqbal et al. (2024) and Liu et al. (2020)

demonstrate that gamified learning strategies, such as badges, scores, and progress indicators, foster persistence and engagement among learners. These studies collectively suggest that digital environments, when properly implemented, enhance both motivation and grammatical development in EFL contexts.

From a theoretical perspective, these findings are supported by different learning theories. Behaviorist and cognitive approaches explain that reinforcement, repetition, and feedback strengthen learning processes (Meza, 2013; Amaya & Aurea, 2019), while deeper cognitive processing and multimodal input improve retention (Contreras-Salas, 2012; Krashen, 1985). Likewise, input-based and usage-based theories emphasize meaningful practice, showing that digital tools facilitate the application of grammar in real communicative contexts (Willis, 2021; Brown, 2007).

However, despite this growing body of evidence, the implementation of digital tools in Ecuadorian higher education remains underexplored. Although Zamora and Flores (2023) indicate that these tools enhance grammatical competence, autonomy, and engagement, they also highlight the need for further research to understand their effectiveness in specific local contexts.

2.2 Theoretical Foundation

2.2.1 Theoretical Support

2.2.1.1 Constructivist Learning Theory. Constructivist learning theory, primarily influenced by Jean Piaget and Lev Vygotsky, provides a strong theoretical foundation for understanding how students acquire and internalize new knowledge through dynamic and interactive experiences. According to Piaget's theory of cognitive development, learning occurs through active engagement and the ongoing processes of assimilation and accommodation, allowing learners to restructure their mental schemas as they encounter new linguistic information (Lourenço, 2020).

In the context of digital grammar instruction, this framework suggests that learners benefit from interactive tools such as mobile applications and online platforms that challenge existing knowledge and promote discovery-based learning. By engaging with grammar exercises in digital environments, students construct understanding through

experimentation, self-correction, and feedback an approach that aligns closely with Piaget's emphasis on active cognitive participation (Lourenço, 2020).

While Piaget's model highlights individual cognitive development, Vygotsky's sociocultural theory emphasizes the crucial role of social interaction and cultural tools in facilitating learning. Central to Vygotsky's perspective is the Zone of Proximal Development (ZPD), which represents the distance between what learners can achieve independently and what they can accomplish with appropriate support from teachers, peers, or technological mediation. Within this framework, digital tools function as mediating resources that scaffold grammar acquisition by providing structured feedback, guided practice, and interactive contexts for communication. These platforms support learners' progress within their ZPD by enabling them to apply grammatical rules in meaningful contexts, receive immediate reinforcement, and engage in collaborative learning experiences. This process reflects Vygotsky's assertion that language development and higher-order thinking are best cultivated through mediated interaction with cultural artifacts and more knowledgeable others (Jonassen & Rohrer-Murphy, 1999).

2.2.1.2 Cognitive Load Theory. Cognitive Load Theory (CLT), developed by John Sweller, provides an essential framework for understanding how learners process information and how instructional design can optimize learning outcomes. CLT posits that working memory has a limited capacity, and therefore, instructional methods should aim to reduce unnecessary cognitive demands while promoting effective schema construction (Sweller, 1988).

In the context of digital grammar instruction, poorly designed interfaces, excessive multimedia elements, or overwhelming information can create extraneous cognitive load, hindering students' ability to internalize grammatical rules. Conversely, digital tools that incorporate clear explanations, guided practice, and structured feedback help learners focus on essential aspects of grammar, thereby facilitating schema automation and long-term retention.

Recent applications of CLT emphasize the importance of balancing intrinsic, extraneous, and germane load in digital learning environments. Intrinsic load, determined by the complexity of the material, can be managed by breaking down grammar topics into smaller, scaffolded steps. Extraneous load can be minimized through user-friendly digital

platforms that eliminate distractions and present information in an organized manner. Germane load, on the other hand, refers to the cognitive resources devoted to meaningful learning and schema development; digital grammar tools such as English Grammar in Use or LearnEnglish Grammar foster this by offering interactive tasks, immediate feedback, and opportunities for repetitive practice in authentic contexts. Thus, CLT provides a theoretical rationale for the design and use of digital tools that align with human cognitive architecture, ensuring efficiency and effectiveness in grammar acquisition (Sweller, 1988).

2.2.1.3 The Substitution, Augmentation, Modification, and Redefinition (SAMR) Model for Technology Integration. The SAMR model, introduced by Puentedura (2006), provides a practical framework for evaluating and guiding the integration of technology into educational practices. It consists of four levels: Substitution, Augmentation, Modification, and Redefinition. At the Substitution and Augmentation stages, technology serves primarily as a tool to enhance traditional practices, such as using grammar applications instead of printed worksheets. The Modification and Redefinition stages, however, allow for a transformative use of technology, enabling tasks that were previously inconceivable. For instance, digital platforms can facilitate interactive grammar exercises with instant feedback, collaborative writing tasks, and peer-to-peer correction through online forums or mobile applications, offering opportunities beyond what traditional methods could provide (Puentedura, 2013).

2.2.1.4 Technological Pedagogical Content Knowledge (TPACK). The Technological Pedagogical Content Knowledge (TPACK) framework, developed by Mishra and Koehler (2006), provides a comprehensive model for understanding the knowledge teachers need to effectively integrate technology into their instructional practices. TPACK emphasizes the intersection of three domains: content knowledge (what is being taught), pedagogical knowledge (how it is taught), and technological knowledge (the tools used for teaching). The integration of these domains allows educators to design learning experiences that are both technologically relevant and pedagogically sound. In the context of English grammar instruction, TPACK highlights the importance of aligning digital resources such as LearnEnglish Grammar or BBC Learning English with appropriate pedagogical strategies to enhance learners' grammatical competence.

2.2.2 Teaching English Grammar

Grammar is a central component of language learning because it provides the structure needed to form meaningful and accurate sentences. It is generally understood as a system of rules that guides how words are organized and interpreted within a language. This system includes elements such as phonology, morphology, syntax, and semantics, all of which work together to support comprehension. In essence, grammar offers the framework that makes communication coherent and effective (Jyoti,2020).

Teaching grammar plays a key role in developing communicative competence in English. Its purpose goes beyond the memorization of rules; it seeks to help learners apply grammatical knowledge appropriately in real contexts. When students understand how grammar operates within meaningful communication, they can express ideas more clearly and interpret messages with greater accuracy. This practical use strengthens their confidence and supports more natural language production (Anani, 2020).

Grammar also influences the development of the four language skills: listening, speaking, reading, and writing. A solid grammatical foundation enables learners to construct accurate sentences, understand complex ideas, and adapt their language to different communicative situations. As students progress, grammar helps them organize information logically and avoid misunderstandings. For these reasons, it continues to be an essential element in achieving overall linguistic proficiency (Jyoti,2020).

2.2.2.1 Importance of Grammar in Language Learning. Structured grammar instruction is essential for developing balanced language proficiency. Despite growing emphasis on communicative language teaching, learners frequently struggle with basic grammatical errors such as incorrect verb forms, subject-verb agreement issues, and article misuse (Rintaningrum, 2023). The authors argue that integrating contextualized grammar instruction and technology-enhanced methods into curricula can help bridge the gap between communicative and accuracy skills, fostering stronger linguistic competence across the speaking, listening, reading, and writing domains.

On the other hand, Hammad and Al-Sarraf (2020) pointed out that grammar is essential for producing accurate and coherent communication, particularly in academic settings. Building on this idea, grammar functions as the structural foundation that allows learners to express meaning clearly and effectively.

Without sufficient grammatical control, students struggle to articulate complex ideas or understand detailed input. For this reason, contemporary approaches view grammar as a central component of communicative competence rather than a set of isolated rules. Integrating explicit instruction with contextualized practice helps learners apply structures meaningfully and strengthen both accuracy and fluency. This balanced approach enables them to participate more confidently in everyday and academic communication (Hockly, 2016).

2.2.2.2 Common Challenges in Grammar Acquisition. Many English learners struggle with grammar due to a combination of cognitive, instructional, and environmental factors. At the cognitive level, students often find it difficult to grasp abstract grammatical concepts such as verb tenses or subject–verb agreement, especially when instruction lacks context or meaningful examples. Traditional methods based on rote memorization and repetitive drills make grammar feel disconnected from authentic communication. Furthermore, in regions with limited exposure to English outside the classroom, learners rarely have opportunities to apply grammatical structures in real conversations. These challenges are particularly evident in English as a Foreign Language (EFL) context, where students rely heavily on classroom instruction. Consequently, innovative, learner-centered strategies supported by digital tools are needed to connect grammatical rules with real-world language use (Mustakim, Jaya, & Jabri, 2025).

Another significant challenge arises from the influence of learners' first language (L1). When grammatical structures differ greatly between the native language and English, recurring errors such as incorrect use of articles or prepositions are common. A large-scale study with Chinese EFL learners revealed that L1 interference, coupled with the complexity of English grammar rules, often leads to confusion and reduced motivation (Huang, et al., 2022). To address these difficulties, modern digital learning platforms such as BBC Learning English or LearnEnglish Grammar provide interactive exercises and contextualized feedback that help learners identify and correct errors in real time. By integrating such tools, educators can make grammar instruction more engaging, adaptive, and culturally responsive, bridging the gap between theoretical knowledge and practical application.

2.2.2.3 Approaches to Teaching Grammar in EFL Contexts. Grammar teaching in English as a Foreign Language (EFL) context has evolved from traditional rule-based methods toward more dynamic, context-sensitive, and technology-supported practices. A

comparative study across Sweden, Austria, and France revealed significant differences in grammar pedagogy: while teachers in Austria and France often employ explicit, structured grammar instruction, Swedish educators favor more implicit approaches centered on fluency and incidental grammar learning. These differences are shaped by curriculum policies, teacher training systems, and learners' exposure to English outside the classroom. The study underscores the need to align instructional strategies with sociocultural and institutional contexts while integrating technological tools that enhance interaction and learner autonomy (Schurz & Coumel, 2023).

Building on this perspective, Sudharshana (2021) classifies grammar instruction into three main approaches: structural, meaning-focused, and form-focused teaching. Structural approaches emphasize explicit rule learning and accuracy, often relying on deductive techniques. In contrast, meaning-focused instruction prioritizes communication, enabling learners to internalize grammar through authentic interaction. Form-focused approaches bridge these two perspectives by embedding grammar learning within communicative tasks that promote both fluency and accuracy.

When supported by digital tools such as BBC Learning English, LearnEnglish Grammar (British Council), and English Grammar in Use (Cambridge), these approaches become even more effective. Such platforms provide interactive exercises, instant feedback, and self-paced learning environments that encourage consistent practice and contextualized understanding. Consequently, technology acts as a bridge between theory and practice, helping students apply grammatical knowledge in meaningful and communicative ways.

2.2.3 Digital Tools in Education

2.2.3.1 The Role of Technology in Language Learning. Technology has fundamentally transformed language learning by fostering more interactive and learner-centered environments. Recent research demonstrates that the use of digital resources enhances learners' comprehension and retention by providing varied and engaging input. These tools enable students to receive immediate feedback and practice language skills at their own pace, which increases motivation and supports personalized learning paths. This technology-mediated approach allows learners to develop stronger grammar awareness, listening comprehension, and vocabulary acquisition compared to traditional instruction focused primarily on passive learning (Isaee & Barjesteh, 2022).

Furthermore, immersive and interactive digital contexts create emotionally supportive spaces where learners can engage with the language more confidently. Studies indicate that environments offering contextualized and meaningful interactions promote not only linguistic gains but also critical thinking and collaborative skills. By reducing anxiety and providing scaffolded opportunities for practice, these learning settings enhance students' creative language use and problem-solving abilities competencies that are essential for real-world communication (Hung & Yeh, 2023).

2.2.3.2 Characteristics and Benefits of Digital Tools. Digital tools are distinguished by their capacity to create interactive learning environments that actively engage learners in the process of language acquisition. In grammar instruction, this interactivity facilitates deeper cognitive processing by encouraging learners to apply grammatical rules within meaningful and communicative contexts rather than memorizing them in isolation. Moreover, digital tools provide immediate corrective feedback, allowing students to identify and amend errors in real time an essential feature for improving grammatical accuracy and fluency (Isaee & Barjesteh, 2022).

These platforms also adapt to individual learner needs, offering personalized practice paths that foster autonomy and motivation. The multimodal nature of digital tools, which integrates visual, auditory, and textual input, caters to diverse learning preferences and reinforces understanding (Isaee & Barjesteh, 2022). Furthermore, many of these tools, such as BBC Learning English, LearnEnglish Grammar, and English Grammar in Use, incorporate collaborative and interactive components that promote authentic communication and peer learning, both of which are crucial for effective language acquisition.

2.2.4 English as a Foreign Language (EFL) Approaches

English as Foreign Language (EFL) approaches refer to pedagogical strategies designed to teach English in contexts where it is not the dominant language. These approaches emphasize systematic exposure to grammar, vocabulary, and communicative functions to support learners in achieving proficiency. Contemporary EFL instruction integrates both traditional methods, such as grammar-translation, and modern communicative approaches, which focus on meaningful interaction. Recent studies demonstrate that combining digital tools with EFL approaches enhances student engagement and facilitates autonomous learning, particularly in grammar acquisition (Richards &

Reppen, 2021). By incorporating technology, teachers can provide authentic materials and interactive activities that mirror real-life communication, ensuring that learners not only acquire linguistic knowledge but also develop functional communicative competence (Celce-Murcia, 2014).

2.2.5 Learner-Centered Approach

The learner-centered approach places students at the core of the learning process, shifting the focus from teacher-led instruction to active student participation. This framework emphasizes autonomy, collaboration, and critical thinking, allowing learners to take responsibility for their own progress. In grammar instruction, this approach encourages students to engage with tasks that are personally meaningful and contextually relevant, fostering deeper understanding and retention. Research highlights that learner-centered strategies, particularly when supported by digital platforms, increase motivation and engagement by giving students greater control over the pace and mode of their learning (O'Neill & McMahon, 2020). By adopting this approach, EFL teachers can create more inclusive and adaptive environments that cater to diverse learner needs.

2.2.6 Task-Based Learning (TBL)

Task-Based Learning (TBL) is an instructional approach that organizes language learning around the completion of meaningful tasks rather than isolated grammar drills. A task is defined as an activity where learners use language to achieve a communicative goal, such as solving a problem, creating a project, or engaging in role-play. In EFL contexts, TBL is particularly effective because it encourages authentic language use and provides opportunities for learners to apply grammar in real-world situations. Scholars argue that TBL not only promotes grammatical accuracy but also fluency and confidence in communication (Bolen et al., 2022). When integrated with digital tools, such as interactive grammar applications or online collaborative platforms, TBL creates dynamic learning environments that foster both linguistic development and learner autonomy.

2.2.7 Digital Literacy Instruction.

Digital Literacy Instruction refers to the process of developing students' ability to effectively and critically use digital technologies for learning, communication, and problem-solving. It goes beyond basic technical skills by incorporating the capacity to evaluate online information, create digital content, and participate responsibly in digital environments.

According to Aslan (2021), digital literacy involves new social practices shaped by emerging technologies, where learners actively construct meaning through collaboration and interaction in digital spaces. In educational contexts, integrating digital literacy instruction supports the development of critical thinking, creativity, and autonomy, which are essential competencies for the 21st century. Moreover, it enables students to become not only consumers of information but also responsible creators and participants in digital communities.

2.2.8 Technology-Enhanced Learning (TEL)

Technology-Enhanced Learning (TEL) is an educational approach that incorporates digital technologies into teaching and learning processes with the purpose of improving educational outcomes and enriching students' learning experiences. Rather than simply introducing technology into the classroom, TEL emphasizes the meaningful integration of digital resources to support instruction, increase student engagement, and facilitate access to knowledge. According to Passey (2019), TEL involves the use of technological tools that enhance the quality of learning by providing opportunities for interaction, collaboration, and active participation. As a result, technology becomes a pedagogical resource that supports learners in achieving educational objectives more effectively.

The implementation of TEL has become increasingly relevant in language education because digital technologies provide diverse opportunities for practice, feedback, and autonomous learning. Through online platforms, educational applications, multimedia resources, and interactive activities, students can engage with content in flexible and personalized ways that respond to their individual learning needs. Scheiter (2021) argues that technology-enhanced environments can improve learning outcomes when digital tools are aligned with pedagogical objectives and instructional content. In the context of English grammar instruction, TEL enables learners to access explanations, examples, exercises, quizzes, and immediate feedback, which contribute to the development of grammatical competence. In the present study, the TEL approach was reflected in the use of LearnEnglish Grammar, BBC Learning English, and English Grammar in Use as digital tools designed to support grammar learning and promote students' active participation in the learning process.

2.2.9 Digital Assessment through ICT

Digital assessment through Information and Communication Technologies (ICT) refers to the use of digital tools and platforms to design, deliver, and evaluate student learning in a more flexible and efficient manner. Unlike traditional assessment methods, ICT-based assessment allows for interactive tasks, immediate feedback, and continuous monitoring of student progress. According to Islas et al. (2023), digital assessment enhances formative evaluation by enabling teachers to collect real-time data and adapt instruction to learners' needs. Tools such as online quizzes, learning management systems, and educational applications not only support accuracy in grading but also promote student engagement and autonomy, as learners can track their own progress and identify areas for improvement.

2.2.10 Effectiveness of Digital Tools in Academic Performance

2.2.9.1 Measuring Improvement Through Digital Platforms. Measuring learners' improvement through digital platforms involves tracking academic progress using embedded assessment tools, user analytics, and performance feedback. These platforms typically include diagnostic quizzes, interactive grammar exercises, and adaptive tasks that generate data on accuracy, completion rates, and time-on-task, offering teachers and researchers valuable insights into learning outcomes. When used consistently, such features allow both learners and educators to monitor progress over time and identify specific areas that need reinforcement (Amin & Paiman, 2022).

According to studies, digital environments not only facilitate frequent low-stakes testing but also support formative assessment through immediate feedback and personalized recommendations. This continuous feedback loop strengthens learners' metacognitive awareness and encourages self-regulated learning strategies. Evidence shows that students who regularly engage with digital grammar platforms demonstrate statistically significant improvements in test scores and written accuracy, compared to those who rely solely on printed materials or instructor-led instruction (Bondarenko & Gudkova, 2023).

2.2.9.2 Comparison of Traditional vs. Digital Grammar Instruction. Digital grammar instruction provides learners with immediate feedback, interactive activities, and opportunities for autonomous practice that go beyond the limitations of traditional classroom settings. These features enhance engagement and motivation, while also supporting differentiated learning by adapting to diverse learner needs. Technology-assisted grammar learning additionally offers affordances such as access to corpora, collaborative platforms,

and individualized pacing, which collectively contribute to improved grammatical competence and sustained learner interest (Noor et al., 2023).

The impact of digital instruction becomes more pronounced when it is strategically integrated into blended learning environments that balance technology with explicit traditional teaching. Students who engaged with Web 2.0 tools have been shown to outperform their peers in grammar acquisition, while also reporting higher levels of motivation and self-confidence. Findings reveal that when digital resources are combined with structured pedagogical guidance, learners benefit from both flexibility and meaningful interaction, suggesting that blended digital-traditional instruction yields superior outcomes ($d = 0.72$, $p < .001$) compared to either modality alone (Celik & Kara, 2024).

2.2.11 Free Digital Tools for Grammar Learning

2.2.10.1 LearnEnglish Grammar - British Council. LearnEnglish Grammar, developed by the British Council, is a widely recognized digital resource designed to support English language learners in improving their grammar skills. This platform offers structured progression through different grammatical topics, catering to various proficiency levels from beginner to advanced. One of the key features of LearnEnglish Grammar is its interactive exercises that provide immediate feedback, enabling learners to identify and correct mistakes effectively. The platform emphasizes contextualized learning by embedding grammar practice within meaningful sentences and real-life scenarios, which aids in transferring skills to authentic communication. Research highlights that such focused and scaffolded digital tools enhance learner motivation and promote autonomous study habits, especially when combined with traditional classroom instruction (LearnEnglish Grammar, s.f.).

Furthermore, LearnEnglish Grammar supports mobile accessibility, allowing learners to engage with grammar practice anytime and anywhere, which increases opportunities for repeated exposure and practice. This flexibility aligns with cognitive theories of distributed practice and self-determination theory's emphasis on learner autonomy. Additionally, the British Council's reputation ensures that the content is pedagogically sound and regularly updated to reflect current linguistic trends and learner needs. Studies have shown that users of LearnEnglish Grammar report increased confidence in their grammatical accuracy and improved performance in both writing and speaking tasks, making it an effective supplementary tool in EFL contexts (Aljasir, 2023).

2.2.10.2 British Broadcasting Corporation (BBC) Learning English. British Broadcasting Corporation (BBC) Learning English is a reputable and comprehensive platform designed to support English language learners worldwide through diverse and accessible resources. The platform provides a variety of grammar lessons embedded within engaging video content, audio podcasts, quizzes, and interactive exercises, which cater to different proficiency levels. One of its strengths lies in contextualizing grammar teaching within real-life situations and contemporary topics, making the learning experience relevant and meaningful. This approach not only helps learners understand grammatical rules but also demonstrates their practical application in everyday communication, thereby enhancing retention and transferability (BBC Learning English, s.f).

Moreover, BBC Learning English emphasizes learner autonomy by offering flexible access to materials, which learners can use at their own pace and convenience. The platform also incorporates features that encourage repeated exposure and spaced learning, known to improve long-term retention of grammatical knowledge. Studies have documented the effectiveness of BBC Learning English in boosting learner motivation and engagement, particularly due to its user-friendly design and authentic content. Additionally, its free accessibility ensures equity in language learning opportunities, making it a valuable tool in both formal and informal educational contexts (BBC Learning English, s. f.).

2.2.11.3 English Grammar in Use - Cambridge. English Grammar in Use by Cambridge University Press is one of the most renowned grammar resources for English language learners worldwide. It offers a clear and systematic presentation on grammar topics, organized in a user-friendly manner suitable for self-study or classroom use. The resource combines concise explanations with varied practice exercises, enabling learners to reinforce their understanding through application. Its design emphasizes clarity and accessibility, allowing learners of different proficiency levels to grasp complex grammatical concepts effectively. Research has demonstrated that English Grammar in Use significantly improves learners' grammatical accuracy and confidence, especially when supplemented with consistent practice and feedback (Cambridge, s. f.).

Moreover, the Cambridge team has developed digital versions and companion apps to complement the printed material, integrating interactive elements that enhance learner engagement. These digital adaptations offer immediate feedback and adaptive learning paths, which cater to individual learner needs and promote autonomous study habits. The

resource's pedagogical approach aligns with contemporary language acquisition theories, emphasizing contextualized learning and incremental skill development. Studies confirm that learners who utilize English Grammar in Use alongside digital tools tend to perform better in both formal assessments and real-world communication scenarios (Alvarez & Thompson, 2021).

2.2.12 Students' Perceptions and Learning Experience

2.2.11.1 Motivation and Engagement in Digital Learning. Recent evidence from Thai higher education demonstrates that gamified grammar instruction can significantly enhance student motivation, enjoyment, and engagement in online English courses. Waluyo, Phanrangsee, and Whanchit (2023) conducted a 12-week controlled study with A1-A2 English learners, where one group was taught through gamified digital grammar activities while another group received traditional instruction without gamification. The results indicated that students who engaged with gamified tasks reported higher levels of enjoyment and lower levels of anxiety, showing that game elements such as points, levels, and immediate feedback can create a more positive and supportive learning environment.

Furthermore, the gamified group achieved better performance outcomes on grammar tests, suggesting that the motivational affordances of gamification translate into measurable academic gains. Although the study noted that increases in motivation and emotional engagement did not always align perfectly with test scores, it emphasizes the importance of designing digital tools that sustain learner interest and reduce barriers to active participation in grammar learning (Waluyo et al., 2023).

2.2.11.2 Students' Preferences and Attitudes. University students across multiple countries report diverse and generally positive attitudes toward digital tools for language learning. Students indicated clear preferences for tools that combined multimedia with active grammar practice. Fadhilawati (2021) explored Indonesian junior high students' perceptions of using ICT-enhanced blended instruction, including Zoom, a learning management system, YouTube videos, Quizizz, and Instagram for English grammar lessons. Participants reported that these digital tools made grammar learning more engaging and accessible, and many perceived that they improved both understanding and motivation. Notably, Quizizz stood out for its immediate feedback and interactive quizzes, which both heightened engagement and improved grammatical competence. Overall, students viewed the blended integration of

traditional and digital media as effective and enjoyable, though instructors were encouraged to align tool selection with pedagogical clarity and scaffolded usage (Fadhilawati, 2021).

2.2.13 Activities Applied Within the Intervention Pedagogical Phase

The intervention was structured based on the results of the diagnostic assessment, which identified the need to reinforce grammatical structures at the A1 level of the Common European Framework of Reference for Languages (CEFR). The design followed principles from Task-Based Language Teaching (TBLT), scaffolding (Bolen et al., 2022), and comprehensible input (Krashen, 1985), providing a theoretically grounded approach to second language acquisition. Guided practice and controlled production activities were delivered through the digital platforms LearnEnglish Grammar, BBC Learning English, and English Grammar in Use, selected for their multimodal input, interactivity, and immediate feedback features recognized as particularly effective for beginner learners.

To guarantee the pedagogical suitability of the resources, the intervention incorporated a Digital Tools Analysis Checklist designed under the Technological Pedagogical and Content Knowledge (TPACK) framework and the Substitution, Augmentation, Modification, Redefinition (SAMR) model (Mishra & Koehler, 2006). This instrument assessed aspects such as accessibility, interactivity, and clarity of feedback, which are key indicators of effective digital grammar instruction. Additionally, a Likert Scale Questionnaire was administered to explore students' perceptions regarding motivation, confidence, and the usability of the tools, following recommended guidelines for low-proficiency learners (Cuesta & Grados, 2017). These resources allowed for continuous monitoring of the pedagogical and affective components involved in the intervention.

Academic performance was measured using a pre-test and post-test aligned with Common European Framework of Reference for Languages (CEFR) A1 descriptors, focusing on recognition, accuracy, and controlled production of basic grammatical structures. The evaluation criteria emphasized clarity, reduced linguistic load, and construct validity, following recommendations for beginner-level assessment (Nation & Macalister, 2020). To determine the effectiveness of the intervention, a before-and-after comparison was conducted using the Wilcoxon Signed-Rank Test, appropriate for small samples and non-parametric data (Field, 2018), ensuring statistically reliable conclusions regarding students' grammatical improvement.

3. CHAPTER III. METHODOLOGY

3.1 Research Approach

The present study adopted a quantitative approach, relying exclusively on numerical methods to objectively measure and analyze variables and their relationships using statistical procedures. Data were collected through three instruments. First, a checklist was used to analyze the characteristics and educational value of the selected digital tools. Second, a pretest and a posttest were administered before and after the intervention to evaluate students' academic performance in English grammar. Finally, a perception questionnaire was applied to assess students' perceptions regarding the use of digital tools for grammar learning.

Through the analysis of these instruments, the study sought to determine the effectiveness of free digital tools in supporting English grammar learning among university students. According to Hernández et al. (2010), the quantitative approach focuses on the collection and statistical analysis of numerical data to test hypotheses and ensure objective and generalizable results.

3.2 Research Modality

This study followed a field-based research modality, as the data were collected directly from the students within their regular educational context. This type of modality allows researchers to obtain authentic information about the educational phenomenon as it naturally occurs (Given, 2008).

The study was conducted with legally enrolled first-semester students from the Pedagogy of National and Foreign Languages program at the *Universidad Nacional de Chimborazo* during the 2025-2S academic period. The data collection process took place in the students' normal academic environment, where they interacted with digital learning tools as part of their learning experience. This approach ensured realistic learning conditions and genuine perceptions from the participants.

3.3 Research Design and Type

This investigation followed a pre-experimental one-group pretest-posttest design with no control group. According to Hernández et al. (2010), a pre-experimental design allows researchers to evaluate the effects of an intervention by measuring outcomes before

and after its implementation. Participants were selected based on their pretest results; only students who scored below 7 on the grammar pretest were included in the study, as this score indicated insufficient grammatical knowledge. The procedure consisted of three essential stages. First, a grammar knowledge pretest was administered to determine students' initial level of grammatical knowledge and to identify eligible participants. Second, students interacted with free digital tools for grammar learning. Finally, a grammar posttest was applied to measure possible improvements in students' grammatical knowledge after the implementation of these digital resources.

Similarly, this study was classified as applied research, as it aimed to evaluate the effectiveness of digital tools as a practical strategy to improve English grammar learning, consistent with Rus Arias (2020), who states that applied research seeks to solve practical educational problems through the implementation and evaluation of pedagogical strategies.

3.4 Data Collection Techniques and Instruments

To analyze selected free digital tools for teaching English grammar, the survey technique was employed using a Digital Tools Analysis Checklist as the primary instrument. The checklist evaluated the pedagogical strengths and weaknesses of three widely used free applications, namely LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use (Cambridge University Press), selected based on criteria such as free accessibility, mobile availability, pedagogical quality, alignment with EFL grammar instruction, and widespread use in language learning contexts. The evaluation covered ten criteria: accessibility, interactivity, pedagogical quality, motivational factors, feedback structure, multimodality, cultural relevance, user experience, learning impact, and overall effectiveness, all rated on a five-point scale ranging from 1 (Very Poor) to 5 (Excellent).

Building on this analysis, the impact of implementing these digital tools on students' academic performance was examined through a grammar achievement test administered in two stages: pre-test and post-test. The instrument was based on the English grammar contents established in the syllabus of First-Semester Students of the Pedagogy of National and Foreign Languages Program at Universidad Nacional de Chimborazo (UNACH) during the Academic Period 2025–2S. The test was scored on a ten-point scale and assessed grammatical structures such as present simple, present continuous, past simple, past

continuous, future forms, quantifiers, Wh-questions, modal verbs, and prepositions of place. The pre-test was administered before the intervention and the post-test afterward under identical assessment conditions, enabling the measurement of improvements in grammar learning and academic performance.

Beyond academic performance, students' perceptions regarding the use of digital tools to support English grammar learning were explored through a Likert-scale questionnaire. Its development was informed by the attitude measurement approach proposed by Likert (1932) and by previous studies in educational technology and language learning that examine students' perceptions, motivation, and satisfaction in digital learning environments. The questionnaire consisted of ten closed-ended statements addressing learning enjoyment, motivation, feedback effectiveness, instructional clarity, perceived improvement, language confidence, classroom integration, learning flexibility, and overall user satisfaction. Responses were collected on a five-point scale ranging from Strongly Disagree to Strongly Agree, providing quantitative data on students' attitudes toward digital grammar instruction.

To ensure the validity of the data collection process, all research instruments were designed in collaboration with the academic tutor and aligned with the research objectives. After the necessary revisions and adjustments, the instruments were submitted to expert validators from the Pedagogy of National and Foreign Languages Program at *Universidad Nacional de Chimborazo* (UNACH), who assessed their relevance, pertinence, and suitability. Based on their feedback and recommendations, final refinements were made before the instruments were approved for application.

3.5 Study Population

The target population of this study consisted of first-semester students enrolled in the Pedagogy of National and Foreign Languages program at the *Universidad Nacional de Chimborazo*. These students were attending classes during the 2025–2S academic period in the city of Riobamba, located in the *Chimborazo* province of Ecuador.

This group was selected because they represented learners at the beginning of their academic training in language pedagogy and could benefit significantly from the integration of digital resources designed to support grammar acquisition.

3.6 Sample Size

From the total population of $N = 46$, the study sample consisted of 20 students who were selected through a non-probabilistic convenience sampling method, as these participants scored less than 7/10 on diagnostic, and they were readily accessible during the period in which the research process was conducted within the academic context. Based on the criteria, these students were appropriate for evaluating the impact of free digital tools on grammar learning.

3.7 Methods of Data Analysis and Processing

The data collected during the study were analyzed using a combination of quantitative techniques. First, the data were organized using Microsoft Excel and processed using descriptive and inferential statistical procedures. To analyze the selected free digital tools for teaching English grammar, the results from the Digital Tools Checklist were reviewed using frequencies, percentages, and means to identify general trends and evaluate the characteristics of LearnEnglish Grammar, BBC Learning English, and English Grammar in Use.

To evaluate the impact of implementing these digital tools on students' academic performance, only the pretest and posttest data were considered. First, descriptive statistics, including minimum, maximum, mean, median, and standard deviation, were computed to characterize students' performance and describe changes after the intervention. Then, inferential analysis was conducted to determine whether the observed improvements were statistically significant. The normality assumption was first tested using the Shapiro–Wilk test, which led to the use of the Wilcoxon Signed-Rank Test to compare the pretest and posttest medians. This non-parametric test was applied with a significance level of $\alpha = 0.05$. The analysis was carried out using the free statistical software R, using the RCommander package.

Finally, to assess students' perceptions regarding the use of digital tools as support in learning English grammar, the results from the students' perception questionnaire were analyzed using frequencies, percentages, and means to identify general trends in learners' attitudes and experiences.

3.8 Ethical Considerations

This study was conducted in accordance with ethical principles for educational research, ensuring respect for participants and the confidentiality of the data they provided. First, institutional permission was obtained to carry out the research. Subsequently, the students were informed about the purpose of the study and the procedures involved.

In particular, informed consent was obtained directly from the students, who voluntarily agreed to participate in the study. The confidentiality and anonymity of the participants were guaranteed throughout the entire research process, and the data collected were used exclusively for academic purposes.

4. CHAPTER IV. RESULTS AND DISCUSSION

4.1 Analysis of Free Digital Tools for Teaching English Grammar

The participants of this study consisted of 20 first-semester students who were legally enrolled in the Pedagogy of National and Foreign Languages program at the *Universidad Nacional de Chimborazo* during the 2025–2S academic period.

4.1.1 Digital Tools Analysis Checklist

To evaluate free digital tools for teaching English grammar, such as LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use (Cambridge University Press), a survey was administered to participants with the purpose of conducting a comparative analysis of the most relevant criteria of each application. A summary of the average scores and relative percentages obtained for each evaluated criterion is presented in Table 1.

It was evident that the tools have strengths and areas for improvement across different criteria; however, all of them fall within the “Good” range (4 = Good) according to the measurement scale. The highest-rated application was BBC Learning English, which obtained the highest average among the three, while LearnEnglish Grammar and English Grammar in Use showed a tie.

Overall, all applications presented relatively lower scores in the criteria of Feedback and Availability, but demonstrated strengths in other areas. For this reason, it is necessary to analyze each tool individually according to the criteria assessed.

Table 1

Descriptive Statistics of Digital Tools Analysis Checklist

Criteria	LearnEnglish Grammar mean (%)	BBC Learning English mean (%)	English Grammar in Use mean (%)
Availability	4.70 (94%)	4.70 (94%)	4.60 (92%)
Feedback	4.65 (93%)	4.65 (93%)	4.60 (92%)
Corrections	4.80 (96%)	4.80 (96%)	4.70 (94%)
Multimodality	4.70 (94%)	4.80 (96%)	4.80 (96%)
Examples	4.75 (95%)	4.60 (92%)	4.65 (93%)
Usability	4.65 (93%)	4.75 (95%)	4.85 (97%)

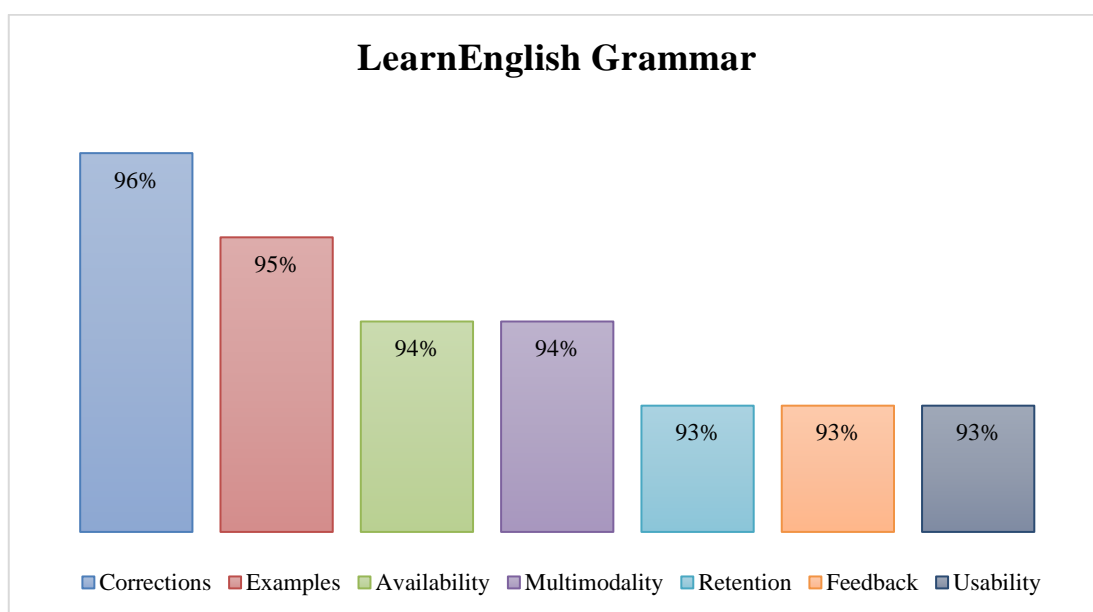
Retention	4.65 (93%)	4.75 (95%)	4.70 (94%)
Mean	4.70 (94%)	4.72 (94%)	4.70 (94%)

Note. N = 20. % = Percentage. Each criterion represents a question applied in the survey. It was rated using a five-point scale (1= Very Poor, 2 = Poor, 3 = Acceptable, 4 = Good, 5 = Excellent).

4.1.1.1 LearnEnglish Grammar Criteria.

Figure 1

Distribution of LearnEnglish Grammar Criteria



Note. N = 20. The values represent the calculated percentages for each criterion, using an equivalent percentage scale (20% = Very Poor, 40% = Poor, 60% = Acceptable, 80% = Good, 100% = Excellent).

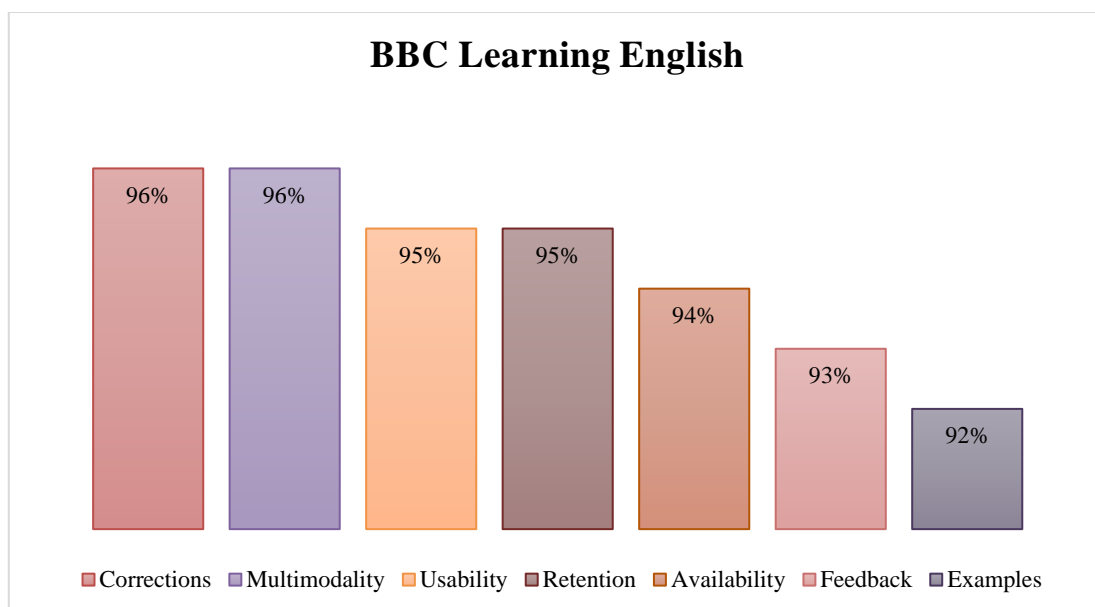
As presented in Table 1 and Figure 1, LearnEnglish Grammar stands out in the criteria of Corrections with 96% and Examples with 95%. This is followed by Availability and Multimodality, both with 94%, and Usability, Retention, and Feedback, all these criteria with 93%. LearnEnglish Grammar shows a balanced profile with peaks in Corrections and

Examples. That is, the application provides automatic correction to users and offers appropriate explanations to support students' autonomous grammar learning. Likewise, it provides clear and contextualized examples for participants, consistent with Beltrán (2017), who states that interaction and immediate feedback support active grammar learning. Similarly, these findings align with Cuesta and Grados (2017), who argue that contextualized examples enhance students' comprehension and autonomy. However, the application has opportunities for improvement regarding feedback, usability, and retention criteria.

4.1.1.2 BBC Learning English Criteria.

Figure 2

Distribution of BBC Learning English Criteria



Note. N = 20. The values represent the calculated percentages for each criterion, using an equivalent percentage scale (20% = Very Poor, 40% = Poor, 60% = Acceptable, 80% = Good, 100% = Excellent).

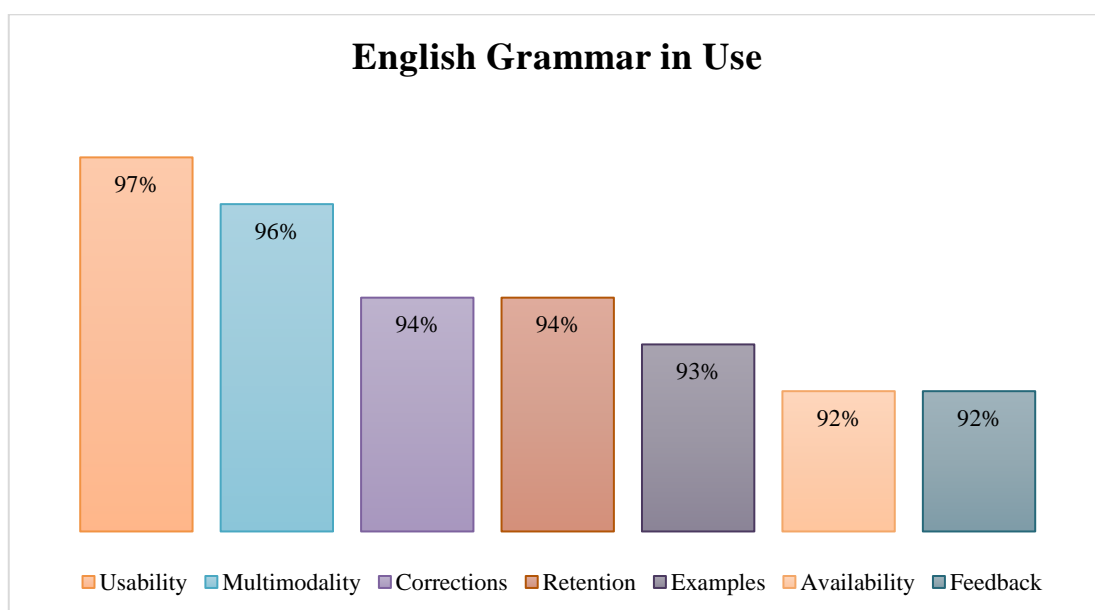
As shown in Table 1 and Figure 2, BBC Learning English stands out in the criteria of Corrections and Multimodality, both with 96%. It also performs strongly in the criteria of Retention and Usability, both with 95%, followed by 94% for Availability and Feedback, and 93% for Examples.

BBC Learning English is the most prominent application in several criteria analyzed, such as Corrections, Multimodality, Retention, and Usability. It excels in providing automatic corrections and integrating text, audio, and visual elements that are attractive to students, consistent with Krashen (1985), who highlights the value of comprehensible input in language learning. Likewise, its repeated practice and multimedia content support retention, aligning with Willis (2021), who argues that structured and repeated practice helps learners internalize grammar rules effectively. However, the application shows limitations in providing examples and feedback to students.

4.1.1.3 English Grammar in Use Criteria.

Figure 3

Distribution of English Grammar in Use Criteria



Note. N = 20. The values represent the calculated percentages for each criterion, using an equivalent percentage scale (20% = Very Poor, 40% = Poor, 60% = Acceptable, 80% = Good, 100% = Excellent).

English Grammar in Use stands out in Usability with a score of 97% and in Multimodality with 96%. These are followed by Corrections and Retention with 94%, Examples with 93%, and Feedback and Availability, both with 92%, as presented in Figure 3 and Table 1. English Grammar in Use obtained the highest-rated criterion among the three applications in Usability, which is evident in students' perceptions of its ease of navigation through the grammar content provided. It also stands out for offering varied content that supports participants' different learning styles. However, the criteria of Examples, Feedback, and Availability are perceived as areas that require improvement in this application.

The outcomes related to English Grammar in Use align with the perspective of Papi (2019), who indicates that well-designed digital resources can enhance learner engagement with grammatical content. The results also reflect the view of Palomino (2020) that structured digital environments support more effective grammar practice. However, the lower scores in Examples, Feedback, and Availability suggest that the application would benefit from improvements in these areas to better scaffold students' grammatical learning.

4.2 Analysis of the Impact of Digital Tools on Students' Performance

4.2.1 Pretest and Posttest Results Comparison

To determine the impact of digital tools on students' grammatical performance, pretest and posttest results were analyzed using descriptive and inferential statistics. The instruments were based on the English grammar contents established in the syllabus for first-semester students and were designed in collaboration with the academic tutor, aligned with the research objectives. After the necessary revisions and adjustments, the instruments were submitted to expert validators from the Pedagogy of National and Foreign Languages Program at *Universidad Nacional de Chimborazo* (UNACH). Based on the diagnostic results, students interacted with LearnEnglish Grammar, BBC Learning English, and English Grammar in Use during the implementation phase.

4.3.1.1 Descriptive Statistics. The results of the descriptive statistics obtained from administering the test at two different stages (Pretest and Posttest) are presented in Table 2.

Table 2

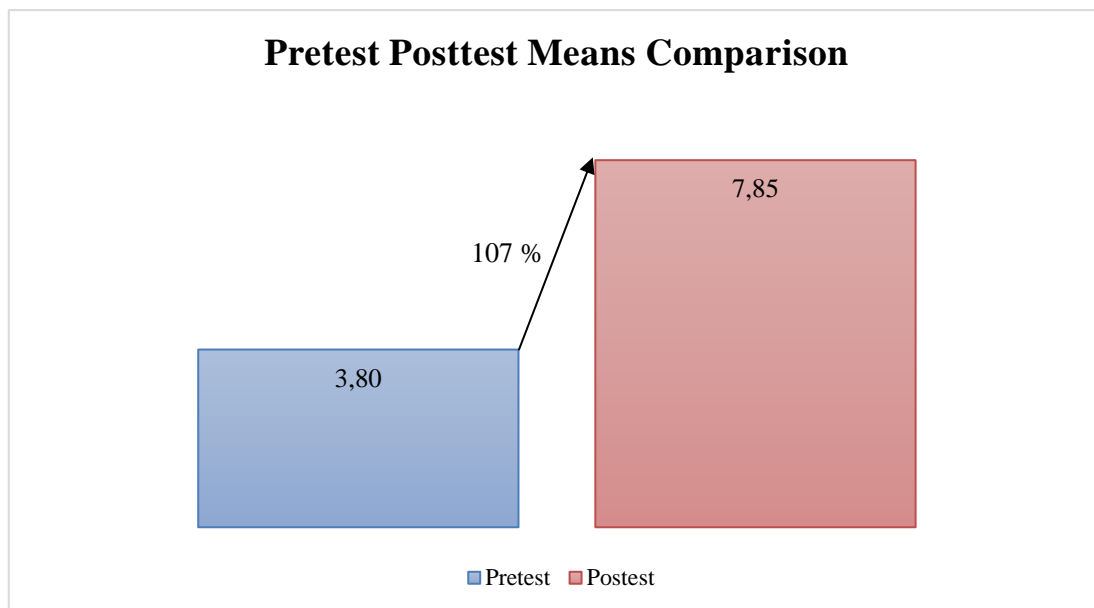
Descriptive Statistics for Pretest and Posttest

Measure	Pretest	Posttest	Difference	Percentage
Min	1.00	4.00	3.00	300%
Max	6.00	8.00	2.00	33.33%
Mean	3.80	7.85	4.05	107%
Median	3.00	8.00	5.00	167%
Standard Deviation	2.48	1.46	-1.02	-41%

Note. N = 20. Data were gathered from a 10-point grammar knowledge test supplied in two separated stages.

Figure 4

Increase Comparison for Pretest and Posttest Means



Note. N = 20. Data were gathered from a 10-point grammar knowledge test administered in two separate stages. The 107% represents a relative percentage increase in the posttest of more than half the value of the pretest.

Table 2 presents descriptive statistics across evaluation stages. From pretest to posttest, notable improvements were observed in the form of relative percentage change: the minimum score increased from 1 to 4 (300%), the maximum score increased by 33.33%, and the median increased by 167%. Furthermore, the standard deviation decreased by 41%, indicating greater score consistency among participants. As shown in Figure 4, the mean score increased by 107% between the pretest and posttest.

There was a sustained improvement in all the descriptive statistics analyzed. In particular, greater relative changes compared to the initial measurement were observed in the minimum value and the median, indicating a general tendency toward improvement. Likewise, the reduction in the standard deviation suggests that the participants learned in a more homogeneous manner through the implementation of the free digital tools, consistent with Iqbal et al. (2024), who highlight the positive role of digital tools in improving language learning outcomes. Similarly, these findings align with Isae and Barjesteh, (2022), who state that technology-supported learning environments contribute to more consistent and effective learning performance among students.

4.2.2 Hypothesis Verification

To robustly verify that the substantial improvement is due to the intervention, the following right-sided directional investigation hypothesis was established and tested using an inferential statistical procedure to compare measures of central tendency.

H₀ (Null Hypothesis): The digital tools for teaching English grammar do not significantly improve grammatical acquisition for first-semester students in the *Pedagogía de los Idiomas Nacionales y Extranjeros* program at *Universidad Nacional de Chimborazo* (UNACH) during the academic period 2025-2S.

H₁ (Alternative Hypothesis): The digital tools for teaching English grammar significantly improve grammatical acquisition for first-semester students in the *Pedagogía de los Idiomas Nacionales y Extranjeros* program at *Universidad Nacional de Chimborazo* (UNACH) during the academic period 2025-2S.

To verify this investigation hypothesis, the following procedure was applied:

4.3.2.1 Normality Assumption Verification. To assess the assumption of data normality, the Shapiro-Wilk test was applied given the sample size ($N = 20$). Based on the results, the pretest obtained a probability value greater than the statistical significance level of $\alpha = 0.05$ ($p\text{-value} = 0.05703 > 0.05$). Therefore, the null hypothesis of normality is retained ($p = 0.05703 > 0.05$), suggesting the pretest data do not significantly deviate from normality.

On the other hand, the posttest obtained a probability value lower than the significance level ($p\text{-value} = 0.01789 < 0.05$), indicating that the posttest data do not follow a normal distribution. Since neither of the data sets follows a normal distribution, a nonparametric statistical test is selected to ensure the robustness of the statistical analysis. In this case, the one-tailed Wilcoxon Signed-Rank Test is used.

4.3.2.2 Wilcoxon Signed-Rank Test Results. The Wilcoxon Signed-Rank Test was then applied using RCommander statistical software, and its results are presented in Table 3.

Table 3

Wilcoxon Signed-Rank Test Results

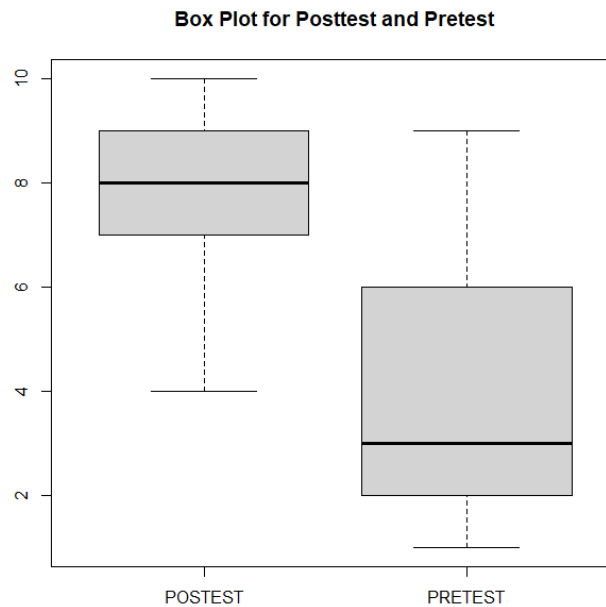
Data	Observed V-statistic	Medians Difference	p-Value
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Posttest and Pretest	171	5	0.0001032
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Note. N = 20. The results were evaluated using R statistical Software, with a significance level $\alpha = 0.05$.

Figure 5

Box Plot of Graphical Analysis of Posttest and Pretest



Note. N = 20. Median of pretest = 3.00, median of posttest = 8.00. The values are gathered from a 10-point grammar knowledge test. There are no atypical values.

Decision

Considering the values shown in Table 3 and the decision rule for the Wilcoxon Signed-Rank test, it is determined that, since the probability value is much lower than the significance level of 0.05 ($p\text{-value} = 0.0001032 < 0.05$), there is statistically significant evidence to reject the null hypothesis and accept the alternative hypothesis. That is, it can be stated that the sustained improvement in the grammatical acquisition of the participants, observed in the present study, is due to the intervention carried out through free digital tools for teaching English grammar and is not the result of chance.

Additionally, through the graphical analysis of Figure 5, it can be verified that the improvement is substantial in all posttest means compared to the pretest, since the median increases by 5 points. Furthermore, it is observed that the dispersion is much lower in the posttest, as the data are more concentrated around the median, while in the pretest, they are more concentrated in the upper part of the median. This implies that the intervention through

free digital tools produces sustained improvements observed in the participants through the inferential analysis of the tests.

4.3 Analysis of Students' Perceptions of Digital Tools for Grammar Learning

A questionnaire on students' perceptions of the use of the digital tools examined was administered to gather their insight regarding the support that free applications provide in learning English grammar. A summary of the indicators analyzed is presented in Table 4.

Table 4

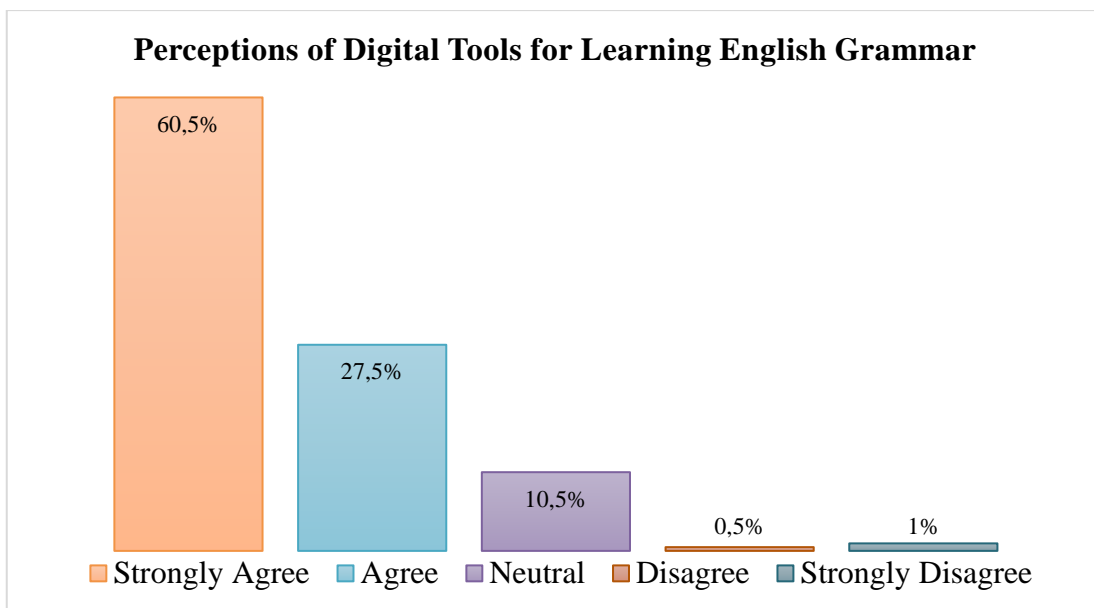
Participant's Perceptions of Free Digital Tools in Learning English Grammar

Item	Indicator	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
1	Learning enjoyment	9 (45)	8 (40)	2 (10)	0 (0)	1 (5)
2	Learning motivation	12 (60)	6 (30)	2 (10)	0 (0)	0 (0)
3	App-based motivation	12 (60)	6 (30)	2 (10)	0 (0)	0 (0)
4	Feedback effectiveness	12 (60)	6 (30)	2 (10)	0 (0)	0 (0)
5	Instructional clarity	11 (55)	6 (30)	1 (5)	1 (5)	1 (5)
6	Perceived improvement	13 (65)	5 (25)	2 (10)	0 (0)	0 (0)
7	Language confidence	14 (70)	4 (20)	2 (10)	0 (0)	0 (0)
8	Classroom integration	12 (60)	5 (25)	3 (15)	0 (0)	0 (0)
9	Learning flexibility	14 (70)	3 (15)	3 (15)	0 (0)	0 (0)
10	User satisfaction	12 (60)	6 (30)	2 (10)	0 (0)	0 (0)
Mean (%)		60.5 %	27.5 %	10.5 %	0.5 %	1 %

Note. N = 20, n = absolute frequency, % = percentage. The survey was applied based on the following scale: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree.

Figure 6

Distribution of Learner's Perceptions of Digital Tools in Learning English Grammar



Note. N = 20. 10 close-ended statements were supplied. The questionnaire was evaluated based on the following scale: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree.

As shown in Figure 6, regarding the indicators evaluated, 60,5% of the participants selected Strongly Agree, 27,5% selected Agree, 10,5% were Neutral, 0,5% selected Disagree, and the remaining 1% chose Strongly Disagree. The results of the questionnaire show that most participants believe that the use of free digital tools for learning English grammar supports their learning and the development of grammatical skills, particularly in terms of confidence and flexibility, consistent with Waluyo et al., (2023), who emphasize that digital learning environments promote learner confidence and autonomous participation. In other words, when using these tools, students are not afraid of making mistakes, unlike in formal instructional settings, since interaction occurs only through their mobile devices.

Additionally, the use of such devices allows learning to take place or be resumed at any moment, providing greater flexibility. To a lesser extent, but still significantly, participants consider that these tools make learning English grammar more enjoyable, in contrast with traditional instructional contexts where there is limited variety of resources for grammar practice, aligning with Lourenço, (2020), who state that mobile and digital learning tools increase flexibility, engagement, and positive attitudes toward language learning.

4.4 Discussion

The results of the Digital Tools Analysis Checklist confirmed that LearnEnglish Grammar, BBC Learning English, and English Grammar in Use demonstrated consistent

pedagogical suitability across all evaluated criteria. These findings align with Beltrán (2017) and Cuesta and Grados (2017), who emphasize that effective grammar learning requires interaction, reflection, and autonomy characteristics evidenced through the platforms' strengths in corrections, multimodality, and usability. Particularly, BBC Learning English stood out in corrections and multimodality, consistent with Contreras-Salas (2012) and Krashen (1985), who argue that multimodal input and meaningful practice enhance grammatical retention. However, the lower scores in feedback across all three platforms confirm a shared limitation, reinforcing the position of Mei et al. (2018) and Palomino (2020), who argue that teacher mediation remains essential to complement autonomous digital practice. These results further support Zamora and Flores (2023), who found that free digital tools enhance grammatical competence in EFL contexts while highlighting the need for structured pedagogical guidance.

The pre- and post-test comparison demonstrated a statistically significant improvement in students' grammatical performance, with the Wilcoxon Signed-Rank Test confirming that progress was directly attributable to the digital intervention rather than chance. These findings are consistent with Salvatierra and Kelly (2023) and Papi et al. (2019), who report that scaffolded digital instruction significantly increases grammatical accuracy among EFL learners. The reduction in standard deviation further indicated a more homogeneous learning distribution, supporting Meza (2013) and Amaya and Aurea (2019), who establish that reinforcement, repetition, and immediate feedback strengthen language learning processes. Additionally, the substantial improvement observed in lower-performing students aligns with Willis (2021) and Brown (2007), who argue that meaningful digital practice facilitates the application of grammar in authentic communicative contexts.

The questionnaire results revealed strongly positive perceptions toward the use of digital tools, with language confidence and learning flexibility emerging as the highest-rated dimensions. These findings align with Iqbal et al. (2024) and Liu et al. (2020), who demonstrate that interactive digital environments foster persistence, engagement, and motivation among English as a Foreign Language (EFL) learners. The high ratings in perceived improvement and learning motivation further support Mei et al. (2018) and Palomino (2020), who argue that platforms combining interactivity and autonomy promote positive affective responses toward grammar learning. The reduction in learning anxiety confirms Beltrán (2017), who emphasizes that Mobile-Assisted Language Learning (MALL) environments effectively reduce the affective filter inhibiting grammar practice. Overall,

these results validate Zamora and Flores (2023), who indicate that free digital tools enhance grammatical competence and learning experience in Ecuadorian EFL contexts.

4.5 Limitations of the research work

The present study was conducted within a limited timeframe and applied to a single academic group, which means the results should be interpreted within this specific context rather than generalized to broader populations. Additionally, not all participants had constant access to the Internet, which is an essential condition for the optimal use of mobile learning tools. However, despite these constraints, the intervention was carried out successfully, allowing for consistent data collection and reliable evaluation of students' progress.

5. CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

LearnEnglish Grammar, BBC Learning English, and English Grammar in Use proved to be effective free digital tools for teaching English grammar, offering structured feedback, corrections, and multimodal content.

The implementation of LearnEnglish Grammar, BBC Learning English, and English Grammar in Use significantly improved students' grammatical performance, demonstrating the effectiveness of digital tools for learning English grammar.

Students showed positive perceptions of the digital tools, reporting greater confidence, flexibility, motivation, and a more comfortable environment for learning English grammar.

5.2 Recommendations

Teachers should incorporate these digital tools into grammar instruction to enhance feedback, interaction, and student engagement.

Educational institutions should promote the integration of digital tools into English grammar instruction to provide learners with more flexible, interactive, and student-centered learning experiences.

It is recommended to integrate digital tools that increase exposure to comprehensible input and promote motivation in English grammar learning.

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ANNEXES

Annex 1. Pedagogical Intervention

Pedagogical Intervention

This pedagogical intervention was designed to enhance English grammatical competence through a structured, multi-stage digital approach. The process began with a pre-test to establish a baseline for students' initial proficiency levels, followed by guided practice using LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC). To evaluate the impact of these mobile tools, a post-test was administered alongside a perception questionnaire and a technical checklist. These instruments collectively analyzed student progress, user satisfaction, and the functional effectiveness of the selected digital platforms in providing structured linguistic feedback.

Context and Participants

The research was conducted at the Faculty of Education, Human Sciences, and Technologies within the Universidad Nacional de Chimborazo. The study involved a group of 20 first-semester students belonging to the Pedagogy of National and Foreign Languages program. All academic activities and data collection related to this intervention were carried out in room U503 of the U Building, providing a controlled environment for monitoring the participants' progress.

Description of the Intervention

The intervention plan consisted of 16 sessions designed to enhance English grammatical proficiency through targeted digital tools. The process began with a pre-test to establish a baseline, followed by guided practice using LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC). Upon completion, a post-test, a perception questionnaire, and a technical checklist were administered to evaluate academic progress and the functional effectiveness of each platform.

Intervention Plan

The following table presents the intervention plan designed to improve students' English grammar through the use of digital tools. First, a pre-test was administered to identify students' initial level of grammar knowledge. After that, students practiced different grammar topics using digital applications such as LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use

(Cambridge University Press), while being guided throughout the process on how to work with each platform. After the implementation of these digital tools, a post-test was applied to determine students' progress in English grammar. Additionally, a questionnaire was used to gather students' perceptions about the use of these technological applications, and a checklist was applied to analyze the most effective and widely used free digital tools that provide structured feedback and can be accessed through mobile devices.

DIGITAL TOOLS FOR TEACHING ENGLISH GRAMMAR

Objectives

General Objective

- To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at *Universidad Nacional de Cuzco* (UNACH), during the academic period 2025-2S.

Specific Objectives

- To analyze selected and widely used free digital tools for teaching English grammar, including as LearnEnglish Grammar (British Council), BBC Learning English (BBC), and English Grammar in Use (Cambridge University Press).
- To evaluate the impact of implementing these digital tools, such as LearnEnglish Grammar (British Council), BBC Learning English (BBC), and English Grammar in Use (Cambridge University Press), on students' academic performance by comparing their results before and after their use.
- To assess students' perceptions regarding the use of digital tools as support in learning English grammar.

Table 5

Pedagogical Intervention Used for free Digital Tools for Teaching English Grammar

Topic	Learning Outcome	Digital Tool	Learning Activities	Students' Work
Pre-Test	To identify students' initial grammar knowledge.	Google Forms	Complete the initial grammar diagnostic.	Respond to test items and share difficulties.

Digital Tools Introduction	To identify and use basic application functions.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Explore the main sections and menus of each platform.	Access the three applications and navigate their interfaces.
Present Simple	To utilize the present simple for routines and facts.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Perform digital quizzes and interactive explanations.	Build sentences and classify daily habits.
Present Continuous	To use and apply the present continuous tense.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Fill in blanks and watch instructional videos.	Write sentences and verify errors through online tests.
Present Simple vs Present Continuous	To differentiate between routines and ongoing actions.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Rewrite and correct contrasting sentences.	Execute autonomous tasks to identify tense contrasts.
Past Simple	To use regular and irregular verbs in the past.	LearnEnglish Grammar (British Council), BBC Learning English.	Sort verbs and sequence past events using videos.	Reconstruct actions and fix past tense forms.

Past Continuous	To describe ongoing actions in the past.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Recognize time markers and match situational images.	Create sentences using the was/were + ing structure.
Past Simple vs Past Continuous	To distinguish interrupted vs. completed past actions.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Classify verbs and reconstruct short stories.	Solve mixed digital exercises and identify errors.
Future Forms	To employ "will" and "going to" for plans.	LearnEnglish Grammar (British Council), BBC Learning English.	Complete predictions and rewrite future statements.	Generate future statements based on digital prompts.
Quantifiers	To use quantity expressions with various nouns.	LearnEnglish Grammar (British Council), BBC Learning English.	Select correct forms and identify noun types.	Fill in phrases and correct quantifier usage.
Modal Verbs	To state obligations and recommendations.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Select modals for everyday situational tasks.	Write brief rules and correct statement errors.
Prepositions	To use <i>in</i> , <i>on</i> , and <i>at</i> for basic locations.	LearnEnglish Grammar (British Council), BBC Learning	Describe places and fill location gaps in context.	Perform selection tasks and write short descriptions.

		English, Cambridge University Press		
Wh-Questions	To construct questions for routines and facts.	LearnEnglish Grammar (British Council), BBC Learning English.	Rearrange words to build accurate question forms.	Create questions and fix incorrect Wh-forms.
Integrated Practice	To consolidate key grammar structures.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Execute multi-tense correction drills and reviews.	Perform mixed rewriting and accuracy activities.
Evaluation Simulation	To perform mixed-format grammar practice tasks.	LearnEnglish Grammar (British Council), BBC Learning English, Cambridge University Press	Complete timed mock-tests and format reviews.	Solve exam-style items and check for accuracy.
Post-Test	To evaluate improvement in grammar mastery.	Google Forms	Submit the final grammar assessment.	Respond to mixed-format items to demonstrate progress.
Questionnaire	To identify students' perceptions of digital tools.	Google Forms	Complete the perception survey items.	Select responses that reflect personal insights.
Checklist	To analyze the effectiveness and usability of tools.	Google Forms	Assess feedback features and mobile accessibility.	Rate interaction and identify platform effectiveness.

Note. The table summarizes the pedagogical intervention implemented over 16 sessions using LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use (Cambridge University Press) as complementary tools for developing grammatical competence.

Pedagogical Sessions Organization

Session 1: Grammar Pre-test Application

Methodological Approach: Digital Literacy Instruction

Date: January 7, 2026, 10:00 –11:00 a.m.

The intervention began at the National University of Chimborazo (UNACH) with the administration of the grammar pre-test to 46 participants. The test was completed individually on mobile phones using Google Forms to identify their initial level of English grammar. After analyzing the results, 20 students who obtained less than 7 points were selected to begin the intervention with digital tools to learn English grammar.

Participants expressed high motivation when using their personal mobile devices for a formal academic task. They noted that the digital format of Google Forms felt more dynamic, accessible, and significantly less intimidating than traditional paper-based evaluations.

Session 2: Digital Tools Introduction

Methodological Approach: Digital Literacy Instruction

Date: January 7, 2026, 11:00 a.m.–12:00 p.m.

Students were introduced to BBC Learning English, which provides short video explanations; LearnEnglish Grammar (British Council), which offers interactive quizzes with immediate feedback; and Cambridge University Press, which includes structured exercises to practice grammar accurately. The group of 20 participants was guided through each platform to ensure they could navigate the interfaces effectively.

The students showed great enthusiasm and curiosity while exploring the three applications for the first time. They reported that the interfaces were highly intuitive and

expressed optimism about having interactive tools to support their autonomous learning process.

Session 3: Present Simple

Methodological Approach: TPACK

Date: January 8, 2026, 10:00–11:00 a.m.

The session focused on learning the Present Simple tense to express routines and general facts. Students used BBC Learning English to watch short explanatory videos and review grammar explanations. They then practiced questions and negative forms through interactive quizzes on LearnEnglish Grammar (British Council) and completed structured exercises from Cambridge University Press. Students also completed one hour of review at home.

The experience was rewarding for the learners, who highlighted the value of receiving immediate feedback from the applications. They felt empowered by correcting their own errors in real-time, which increased their confidence when structuring sentences about their daily routines.

Session 4: Present Continuous

Methodological Approach: TPACK

Date: January 9, 2026, 11:00 a.m.–1:00 p.m.

The session focused on learning the Present Continuous tense to describe actions happening at the moment. Students watched short explanatory videos on BBC Learning English and reviewed the structure to be + verb-ing. They practiced sentence formation through interactive quizzes on LearnEnglish Grammar (British Council) and completed structured activities from Cambridge University Press.

Students participated actively and showed visible excitement when verifying their answers correctly on the platforms. They commented that the use of short videos simplified the understanding of the grammatical structure, making the class feel fluid and engaging.

Session 5: Present Simple and Present Continuous Practice

Methodological Approach: Blended Learning

Date: January 10, 2026 (Duration: 2 hours)

This session was completed independently at home to reinforce the difference between Present Simple and Present Continuous. Students followed instructions to work with the digital platforms previously explained. They watched comparison videos on BBC, completed quizzes on British Council, and practiced with Cambridge exercises to identify tense contrasts and correct sentences.

The participants reported a positive experience while working autonomously from home. They valued the flexibility of being able to replay videos and repeat exercises as many times as necessary, allowing them to consolidate the differences between both tenses without external pressure.

Session 6: Past Simple Instruction

Methodological Approach: TPACK

Date: January 13, 2026, 10:00–11:00 a.m.

The session focused on the Past Simple tense to describe completed actions. Students explored story-based videos on BBC Learning English that presented past events and timelines, and practiced identifying and correcting regular and irregular verbs through LearnEnglish Grammar (British Council). They also completed one hour of review at home using the same digital tools.

During these activities, students showed growing interest in organizing events on digital timelines. They expressed that learning irregular verbs was much easier and more visual thanks to the interactive challenges provided by the applications.

Session 7: Past Continuous Instruction

Methodological Approach: TPACK

Date: January 15, 2026, 10:00–11:00 a.m.

Students learned the Past Continuous tense to describe actions in progress at a specific moment in the past. They watched short scenario-based videos on BBC Learning English and practiced gap-fill activities on LearnEnglish Grammar (British Council) using was/were + verb-ing. To reinforce the topic, they completed one hour of review at home.

Learners felt very comfortable using the applications and mentioned that the visual scenarios from the BBC helped them better understand the context of the grammatical tense. This visual clarity allowed them to complete the exercises with greater confidence and speed.

Session 8: Past Simple and Past Continuous Contrast

Methodological Approach: TPACK

Date: January 15, 2026, 11:00 a.m.–12:00 p.m.

This session focused on distinguishing Past Continuous and Past Simple through short BBC mini-stories showing an action in progress interrupted by another action. Students observed how the structures interact and completed interactive exercises on LearnEnglish Grammar (British Council) to choose the correct tense in different situations.

The students expressed high satisfaction when solving the British Council quizzes, as the narrative logic of the stories allowed them to recognize the differences between tenses naturally. There was a clear sense of achievement in mastering this complex grammatical distinction.

Session 9: Future Forms (Will vs. Going to)

Methodological Approach: TPACK

Date: January 16, 2026, 11:00 a.m.–12:00 p.m.

This session focused on the use of future forms with will and going to for predictions and plans. Students watched short videos on BBC Learning English to identify intentions

and predictions. They then completed interactive quizzes on LearnEnglish Grammar (British Council) to choose the correct form and created their own short examples.

The session was highly dynamic, and students enjoyed predicting future situations. They expressed that using the apps made the practice feel creative and meaningful, allowing them to apply grammar to their own life plans with enthusiasm.

Session 10: Quantifiers Instruction

Methodological Approach: TPACK

Date: January 21, 2026, 10:00–11:00 a.m.

This session focused on the use of quantifiers with countable and uncountable nouns. Students watched explanations on BBC Learning English contrasting forms such as many, much, a few, and a little. They completed short activities on LearnEnglish Grammar (British Council) to select the correct quantifier and performed one hour of review at home.

A sense of curiosity dominated the session as students classified nouns and enjoyed comparing their scores with their classmates. They commented that the interactivity of the platforms turned a typically confusing topic into something intuitive and easy to remember.

Session 11: Modal Verbs (Must / Should)

Methodological Approach: TPACK

Date: January 22, 2026, 11:00 a.m.–12:00 p.m.

This session focused on the use of modal verbs *must* and *should* for obligation and advice. Students watched explanations on BBC Learning English and completed mini-quizzes on LearnEnglish Grammar (British Council) and Cambridge University Press. They practiced by creating examples about classroom rules and healthy habits.

There was a strong interest when students drafted their own health recommendations. They highlighted that the applications provided the necessary structure to express advice formally, helping them feel more competent in their written expression.

Session 12: Prepositions of Place (In / On / At)

Methodological Approach: TPACK

Date: January 23, 2026, 11:00 a.m.–12:00 p.m.

This session focused on the correct use of prepositions of place: in, on, and at. Students watched visual explanations on BBC Learning English and completed selection tasks on LearnEnglish Grammar (British Council) and fill-in activities from Cambridge University Press to describe locations correctly.

Many students mentioned that the videos and real-life examples made the topic extremely easy to grasp. They felt satisfied being able to describe exact locations accurately, valuing the constant visual support provided by the digital tools.

Session 13: Wh-Questions with Present Simple

Methodological Approach: TPACK

Date: January 28, 2026, 10:00–11:00 a.m.

This session focused on forming Wh-questions in the Present Simple. Only BBC Learning English and LearnEnglish Grammar (British Council) were used as they offered clearer explanations. Students completed mini-tasks selecting the correct Wh-word and forming questions about daily routines.

The learners expressed that the explanations in these apps were exceptionally clear. They felt proud of their ability to correctly construct complex questions, which reinforced their sense of progress in the language.

Session 14: Integrated Grammar Practice

Methodological Approach: TPACK

Date: January 29, 2026, 10:00–11:00 a.m.

This session focused on reviewing different grammar structures through mixed exercises. Students watched review clips on BBC Learning English and completed mixed

practice activities on LearnEnglish Grammar (British Council) and short drills from Cambridge University Press.

The learning environment was highly motivating, as students challenged themselves to complete the quizzes with greater speed and higher scores. They commented that this integrated practice helped them realize how much they had advanced since the beginning of the sessions.

Session 15: Evaluation Simulation

Methodological Approach: TPACK

Date: February 4, 2026, 10:00–11:00 a.m.

This session simulated a grammar evaluation to prepare students for the final assessment. Students watched sample-test explanations on BBC, completed timed quizzes on British Council, and mock exercises from Cambridge. Final doubts regarding verb tense contrasts were addressed using the application resources.

Despite initial nerves regarding the timer, students reported that the simulation significantly reduced their anxiety for the final exam. They felt relieved and prepared after receiving quick and direct clarifications through the digital tools.

Session 16: Post-Test Application

Methodological Approach: Digital Assessment

Date: February 5, 2026, 9:00–11:00 a.m.

This session focused on the final grammar evaluation. Students completed a post-test through Google Forms covering all structures studied. Afterward, they completed a short perception questionnaire and a checklist to share their opinions about the platforms used.

The students expressed a deep sense of accomplishment and personal satisfaction. They stated that they felt much more confident in recognizing grammatical structures and appreciated having mobile tools that made learning more accessible and effective.

Annex 2. Informed Consent Letter for First-Year Students



**UNIVERSIDAD
NACIONAL DE
CHIMBORAZO**

Riobamba, enero 7 de 2026

Código: 1.2


CONSENTIMIENTO INFORMADO

Yo, estudiante del primer semestre de la carrera de Pedagogía de los Idiomas Nacionales y Extranjeros de la Universidad Nacional de Chimborazo, manifiesto haber sido informado(a) sobre el trabajo de investigación titulado “**Digital Tools for Teaching English Grammar**”, realizado por la estudiante investigadora Jahaira Nicole Lema Gavidia; asimismo, declaro conocer que el objetivo general de esta investigación es determinar la efectividad del uso de herramientas digitales para la enseñanza de la gramática del idioma inglés en estudiantes de primer semestre durante el período académico 2025–26, y comprendo que los objetivos específicos consisten en analizar herramientas digitales gratuitas como plataformas de apoyo para el aprendizaje de la gramática inglesa, evaluar la percepción de los estudiantes sobre su uso y comparar el rendimiento académico antes y después de su aplicación; de igual manera, se me ha explicado que mi participación incluirá rendir un pre-test y un post-test, participar en sesiones de aprendizaje mediante el uso de herramientas digitales y desarrollar actividades tanto en clase como de forma autónoma.

Por lo tanto, declaro que mi participación es voluntaria, que puedo retirarme en cualquier momento sin ningún tipo de consecuencia, y que la información proporcionada será utilizada únicamente con fines académicos, manteniendo la debida confidencialidad, por lo que expreso mi **CONSENTIMIENTO VOLUNTARIO** para participar en este proceso investigativo.

Last Names and first Names	ID Number	Signature	Comment
1. Garcia Rivera Dalesky Pauleth	0202244430		
2. Asunción Elizalde Andrea Esthelfania	1105620304		
3. Contero Tamay Doménica Mercedes	0605957240		
4. Lema Lema Sara Anabel	0605767697		
5. Santillan Milán Silvia 6. Verónica.	0202336954		
7. Dafne Anahi Vera Chinga	0850446477		
8. Ayol Puma Selena Stefanya	0605840115		
9. Ayol Luca Jenny Nicol	0605224047		
10. Barahona Enriquez Henry Omar	0606121085		
11. Sangucho De La Cruz Bryseida Adala	0504299454		
12. León Alulema Leidy Mayte	0605762046		
13. Ana Lia Lopez Zula	1250906342		
14. Brigitte Estefanía Marán Hidalgo	2350489759		
15. Jennifer Maritza Yaucan Gavilanes	0650148737		
16. Gómez Veloz Odalys Valeska	1250941687		
17. Tuaza Muñoz Alain Alberto	0606074656		
18. Larrea Vásquez Samara Alessandra	0606132843		
19. Merlín Lopez Janina Alejandra	0604989434		
20. Guerrero Rodríguez Marlon Patricia	060454052-6		

Annex 3. Digital Tools Checklist



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Facultad de Ciencias de la Educación, Humanas y Tecnologías. Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros

RESEARCH PROJEC

TOPIC: Digital Tools for Teaching English Grammar

Objective: To analyze the most effective and widely used free digital tools for teaching English grammar, such as LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use (Cambridge University Press), which provide structured feedback and can be accessed through mobile devices.

Purpose:

This instrument aims to analyze and compare the functionality, pedagogical quality, and accessibility of selected digital tools designed to teach English grammar effectively in EFL contexts.

Study Population: First-semester students of the Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros.

The Academic Period 2025–2S

Author: Jahaira Nicole Lema Gavidia.
Jahaira.lemma@unach.edu.ec

* Indica que la pregunta es obligatoria

Full Name *

Tu respuesta _____

Sex:

Female

Male

Age *

16 - 18 years

19 - 20 years

21 - 25 years

26 - 30 years

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* Indica que la pregunta es obligatoria

LearnEnglish Grammar (British Council)

This section explains the use of the *LearnEnglish Grammar* app as a support tool for learning English grammar. It helps first-semester students practice grammar through simple explanations and interactive exercises.

Instructions:

The researcher should use this checklist to evaluate each digital tool according to the established criteria. Rate each feature using the following scale: Poor, Good, and Excellent.

1. Availability on multiple devices, free access, offline mode. *

- Poor
- Good
- Excellent

2. Offers immediate feedback, quizzes, and progress tracking. *

- Poor
- Good
- Excellent

3. Provides automatic corrections with explanations. *

- Poor
- Good
- Excellent

4. Integrates text, audio, and visuals to enhance learning. *

- Poor
- Good
- Excellent

5. Uses authentic examples appropriate for EFL contexts. *

- Poor
- Good
- Excellent

6. Ease of navigation, interface clarity, and design quality. *

- Poor
- Good
- Excellent

7. Demonstrated grammar improvement and retention evidence. *

- Poor
- Good
- Excellent

Atrás

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Annex 4. Students' Perception Questionnaire



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Objective: To assess students' perceptions regarding the use of digital tools as support in learning English grammar.

Purpose: This questionnaire aims to gather students' opinions and perceptions about the use of technological applications such as LearnEnglish Grammar (British Council), BBC Learning English, and English Grammar in Use (Cambridge University Press) in the process of learning English grammar.

Instructions: Read each statement carefully and mark the response that best reflects your level of agreement using the following scale:

Study Population: First-semester students of the Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros.

The Academic Period 2025-2S

Author: Jahaira Nicole Lema Gavidia.
Jahaira.Lema@unach.edu.ec

* Indica que la pregunta es obligatoria

Full Name *

Tu respuesta

Sex: *

Male

Female

Age *

16 - 18 years

19 - 20 years

21 - 25 years


26 - 30 years

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* Indica que la pregunta es obligatoria

Category A Motivation & Interaction

1. Using digital tools makes English grammar learning more enjoyable and interactive. *

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

2. I feel more motivated to study grammar through applications such as LearnEnglish Grammar and BBC Learning English. *

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

3. I feel more motivated to study grammar through applications such as LearnEnglish Grammar (British Council), British Broadcasting Corporation Learning English (BBC), and English Grammar in Use (Cambridge University Press) *

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

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* Indica que la pregunta es obligatoria

Category B Learning Effectiveness

4. Digital tools help me correct my grammar mistakes through instant feedback. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. The explanations and exercises in digital grammar apps are clear and easy to understand. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

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Category C Confidence, Integration & Satisfaction

6. I believe my grammar performance has improved since I started using digital applications. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

7. The use of digital tools increases my confidence when writing or speaking in English. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

8. Teachers should integrate grammar applications into classroom activities. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

9. I can study grammar anytime and anywhere thanks to mobile access. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

10. Overall, I am satisfied with using digital tools as support for learning English grammar. *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

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Annex 5. Pretest: Grammar Assessment



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RESEARCH PROYEC

TOPIC: Digital Tools for Teaching English Grammar

The instrument used in this stage is a grammar knowledge test designed to measure students' initial performance before the use of digital tools. It consists of multiple-choice items that assess key grammar areas such as verb tenses, modal verbs, prepositions, quantifiers, and sentence construction. This pre-test serves as a diagnostic measure to establish a baseline, allowing later comparison with the post-test results to determine changes in students' grammatical performance.

Study Population: First-semester students of the Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros.

The Academic Period 2025-25

Author: Jahaira Nicole Lema Gavidia.

Date: January 14th, 2026

Jahaira.lem@unach.edu.ec

* Indica que la pregunta es obligatoria

Correo electrónico *

Registrar nicole2025cic@gmail.com como el correo electrónico que se incluirá en mi respuesta

Age *

16 - 18 years

19 - 20 years

21 - 25 years

26 - 30 years

Sex: *

Female

Male

Full Name *

Tu respuesta _____

Siguiente

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General Instructions

Read each item carefully and choose the correct option (A, B, C, or D) according to the grammar structure required in each sentence. Do not use dictionaries, mobile phones, or translators.

Total: 10 points. You have 15 minutes to complete this test.

* 1 punto

9. The biology samples are kept _____ a refrigerator _____ 4°C to prevent decomposition.

A) on / for

B) at / in

C) in / at

D) at / on

* 1 punto

6. In the laboratory, there isn't _____ oxygen left in the chamber, and there are only _____ drops of acid remaining.

A) many / little

B) much / a few

C) few / much

D) a little / a few

* 1 punto

7. _____ Instrument helps scientists measure air pressure accurately? *

A) What

B) Whose

C) Which

D) Where

* 1 punto

5. Tomorrow's forecast says it _____, so the physics team _____ their instruments inside the lab.

A) will rain / is going to move

B) is raining / moves

C) is going to rain / will move

D) rained / will be moving

* 1 punto

3. Look! The solution _____ color again. I think it _____ a new gas. *

A) changes / is producing

B) has changed / produces

C) is changing / is producing

D) was changing / produced

8. Students _____ wear gloves while handling hot materials, but they _____ also check if the beaker is clean before use. * 1 punto

- A) can / might
- B) should / must
- C) must / should
- D) might / could

2. Scientists usually _____ chemical reactions in their notebooks, but _____ today they _____ digital sensors to collect data automatically. * 1 punto

- A) are recording / use
- B) record / are using
- C) have recorded / use
- D) recorded / are using

4. During the astronomy session, we _____ the stars when the telescope suddenly _____ working. * 1 punto

- A) analyzed / stops
- B) were analyzing / stopped
- C) were analyzing / had stopped
- D) analyze / was stopping

1. The experiment _____ unexpectedly when the temperature reached 100°C, so the students _____ their observations in a hurry. * 1 punto

- A) starts / are writing
- B) started / wrote
- C) was starting / write
- D) had started / were writing

10. Why _____ the liquid evaporate faster at high altitudes? 1 punto

- A) do
- B) is
- C) does
- D) did

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Annex 6. Posttest: Grammar Assessment



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RESEARCH PROJE

TOPIC: Digital Tools for Teaching English Grammar

The instrument used in this stage is a grammar knowledge test designed to measure students' initial performance before the use of digital tools. It consists of multiple-choice items that assess key grammar areas such as verb tenses, modal verbs, prepositions, quantifiers, and sentence construction. This pre-test serves as a diagnostic measure to establish a baseline, allowing later comparison with the post-test results to determine changes in students' grammatical performance.

Study Population: First-semester students of the Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros.

The Academic Period 2025-25

Author: Jahaira Nicole Lema Gavidia.

Date: January 14th, 2026

Jahaira.lem@unach.edu.ec

* Indica que la pregunta es obligatoria

Correo electrónico *

Registrar nicole2025clc@gmail.com como el correo electrónico que se incluirá en mi respuesta

Age *

16 - 18 years

19 - 20 years

21 - 25 years

26 - 30 years

Sex: *

Female

Male

Full Name *

Tu respuesta _____

SiguienteBorrar formulario

General Instructions

Read each item carefully and choose the correct option (A, B, C, or D) according to the grammar structure required in each sentence. Do not use dictionaries, mobile phones, or translators.

Total: 10 points. You have 15 minutes to complete this test.

* 1 punto

9. The biology samples are kept _____ a refrigerator _____ 4°C to prevent decomposition.

A) on / for

B) at / in

C) in / at

D) at / on

* 1 punto

6. In the laboratory, there isn't _____ oxygen left in the chamber, and there are only _____ drops of acid remaining.

A) many / little

B) much / a few

C) few / much

D) a little / a few

7. _____ instrument helps scientists measure air pressure accurately? * 1 punto

A) What

B) Whose

C) Which

D) Where

5. Tomorrow's forecast says it _____, so the physics team _____ their instruments inside the lab. * 1 punto

A) will rain / is going to move

B) is raining / moves

C) is going to rain / will move

D) rained / will be moving

3. Look! The solution _____ color again. I think it _____ a new gas. * 1 punto

A) changes / is producing

B) has changed / produces

C) is changing / is producing

D) was changing / produced

8. Students _____ wear gloves while handling hot materials, but they _____ also check if the beaker is clean before use. * 1 punto

- A) can / might
- B) should / must
- C) must / should
- D) might / could

2. Scientists usually _____ chemical reactions in their notebooks, but _____ today they _____ digital sensors to collect data automatically. * 1 punto

- A) are recording / use
- B) record / are using
- C) have recorded / use
- D) recorded / are using

4. During the astronomy session, we _____ the stars when the telescope suddenly _____ working. * 1 punto

- A) analyzed / stops
- B) were analyzing / stopped
- C) were analyzing / had stopped
- D) analyze / was stopping

1. The experiment _____ unexpectedly when the temperature reached 100°C, so the students _____ their observations in a hurry. * 1 punto

- A) starts / are writing
- B) started / wrote
- C) was starting / write
- D) had started / were writing

10. Why _____ the liquid evaporate faster at high altitudes? 1 punto

- A) do
- B) is
- C) does
- D) did

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Annex 7. Instrument Validation Documents



Dirección de Postgrado
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 VINCULACIÓN Y POSTGRADO

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Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: Jahaira Nicole Lema Gavidia

Academic tutor: Blanca Narcisca Fuertes López

Type of instrument: Checklist

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					✓
2. Do the items have a logical relation with the study objectives?					✓
3. Do the items have a connection with the study variables?					✓
4. Does the instrument display clear decision categories, dimensions or items?					✓
5. Is there a logical organization with the items display?					✓
6. Do the items contain clear and concise instructions to use the instrument?					✓
7. Are the items clear, appropriate and relevant to the target audience?					✓

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					✓
Reliability	Is the test consistent or free from random errors, presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					✓
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					✓
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					✓
Washbak	Does the instrument have a positive impact on the participants?					✓

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): Jahaira Nicole Lema Gavidia

ID: 0602537347

Jahaira Nicole Lema Gavidia
Signature



Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: Maria Dolores Avalos Obregon

Academic tutor: Blanca Narcisca Fuertes López

Type of instrument: Questionnaire (Likert scale)

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					/
2. Do the items have a logical relation with the study objectives?					/
3. Do the items have a connection with the study variables?					/
4. Does the instrument display clear decision categories, dimensions or items?					/
5. Is there a logical organization with the items display?					/
6. Do the items contain clear and concise instructions to use the instrument?					/
7. Are the items clear, appropriate and relevant to the target audience?					/

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					/
Reliability	Is the test consistent or free from random errors, presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					/
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					/
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					/
Washbak	Does the instrument have a positive impact on the participants?					/

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): MARIA DOLORES AVALOS OBREGON

ID: 0602537847

Maria Dolores Avalos Obregon
Signature



Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: Maria Dolores Avila Obregon

Academic tutor: Blanca Narcisa Fuertes López

Type of instrument: Grammar Test (Multiple-choice Test)

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					/
2. Do the items have a logical relation with the study objectives?					/
3. Do the items have a connection with the study variables?					/
4. Does the instrument display clear decision categories, dimensions or items?					/
5. Is there a logical organization with the items display?					/
6. Do the items contain clear and concise instructions to use the instrument?					/
7. Are the items clear, appropriate and relevant to the target audience?					/

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					/
Reliability	Is the test consistent or free from random errors; presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					/
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					/
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					/
Washbak	Does the instrument have a positive impact on the participants?					/

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): MARIA DOLORES AVILA OBREGON

ID: 0602537347

Maria Dolores Avila Obregon
Signature



Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: *Daysi Valeria Fierro López*

Academic tutor: Blanca Narcisa Fuertes López

Type of instrument: Checklist

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					✓
2. Do the items have a logical relation with the study objectives?					✓
3. Do the items have a connection with the study variables?					✓
4. Does the instrument display clear decision categories, dimensions or items?					✓
5. Is there a logical organization with the items display?					✓
6. Do the items contain clear and concise instructions to use the instrument?					✓
7. Are the items clear, appropriate and relevant to the target audience?					✓

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					✓
Reliability	Is the test consistent or free from random errors; presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					✓
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					✓
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					✓
Washbak	Does the instrument have a positive impact on the participants?					✓

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): *Daysi Fierro*
 ID: *0004026542*
 Signature: *[Handwritten Signature]*



Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: Daysi Valera Fierro López

Academic tutor: Blanca Narcisca Fuertes López

Type of instrument: Grammar Test (Multiple-choice Test)

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5


Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					✓
2. Do the items have a logical relation with the study objectives?					✓
3. Do the items have a connection with the study variables?					✓
4. Does the instrument display clear decision categories, dimensions or items?					✓
5. Is there a logical organization with the items display?					✓
6. Do the items contain clear and concise instructions to use the instrument?					✓
7. Are the items clear, appropriate and relevant to the target audience?					✓

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					✓
Reliability	Is the test consistent or free from random errors; presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					✓
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					✓
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					✓
Washbak	Does the instrument have a positive impact on the participants?					✓

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): Mrs. Daysi Fierro
ID: 6604026542

Signature



Validation of Research Instruments

Theme: Digital Tools for Teaching English Grammar

General Objective: To determine the effectiveness of digital tools for teaching English grammar to first-semester students in the Pedagogy of National and Foreign Languages program at Universidad Nacional de Chimborazo (UNACH), during the academic period 2025-2026.

Author: Jahaira Nicole Lema Gavidia

Evaluator: Daysi Valeria Fierro López

Academic tutor: Blanca Narcisca Fuertes López

Type of instrument: Questionnaire (Likert scale)

Rating scale:

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Aspect 1:

Criteria	1	2	3	4	5
1. Does the instrument gather data suitable and relevant for the research topic?					✓
2. Do the items have a logical relation with the study objectives?					✓
3. Do the items have a connection with the study variables?					✓
4. Does the instrument display clear decision categories, dimensions or items?					✓
5. Is there a logical organization with the items display?					✓
6. Do the items contain clear and concise instructions to use the instrument?					✓
7. Are the items clear, appropriate and relevant to the target audience?					✓

Aspect 2:

Principles of Assessment	Criteria description	1	2	3	4	5
Validity	Does the instrument measure what it intends to measure?					✓
Reliability	Is the test consistent or free from random errors; presenting constant conditions across two or more administrations? Does the instrument give precise directions, and use an appropriate rubric for scoring?					✓
Authenticity	Does the instrument reflect "real-world" language, containing language that is as natural as possible?					✓
Practicality	Is the test appropriate regarding logistical aspects (time, budget, and administrative issues) involved in making, giving, and scoring the instrument?					✓
Washbak	Does the instrument have a positive impact on the participants?					✓

Note: Designed by Fuertes, N (2025)

Validated by (Name and surname): Daysi Valeria Fierro López
ID: 0604026542
Signature:

Annex 8. Sample Lesson Plan: Using Digital Tools for Grammar Learning

LESSON PLAN

Institution: Universidad Nacional de Chimborazo

Program: Pedagogía de los Idiomas Nacionales y Extranjeros

Subject: English

Lesson topic: Present Simple (Daily Routines)

Lesson time: 1 hour

Date: January 8, 2026

Schedule: 10:00 – 11:00 a.m.

Teacher: Jahaira Nicole Lema Gavidia

Methodology base: TPACK, Digital Learning

Main aim: Students will be able to use the Present Simple tense to describe daily routines and general facts through the use of digital tools.

Stage	Activities	Work mode	Resources	Time
Warm-up	The teacher greets students and asks simple questions: “What do you do every day?” Students answer using basic verbs (eat, study, sleep).	Whole class	None	10 min
Pre-teaching	Students watch a short video on BBC Learning English about Present Simple. The teacher explains structure (subject + verb) and examples.	Whole class	Mobile phones, BBC Learning English	15 min
While-teaching	Students complete interactive quizzes on LearnEnglish Grammar (British Council) focusing on affirmative, negative, and questions. Teacher monitors and guides.	Individual	Mobile phones, LearnEnglish Grammar app	20 min
Practice activity	Students create 3–5 sentences about their daily routine (e.g., “I wake up at 7 a.m.”). Then, they share with a partner.	Pair work	Notebook / phone	10 min
Post-activity	Students reflect on what they learned and mention one new sentence. Teacher gives feedback.	Whole class	None	5 min

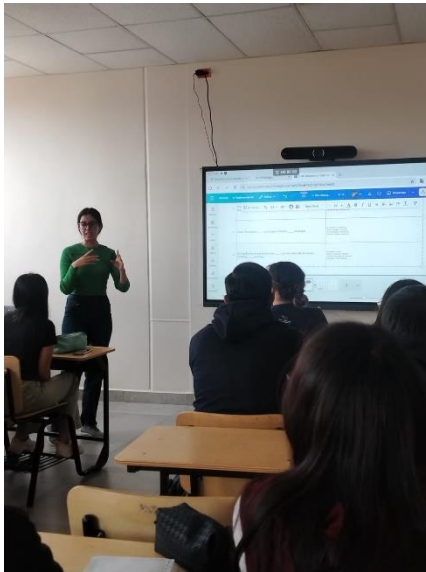
Annex 9. Photographs of the Intervention Classes

Students Completing the English Grammar Pre-Test Using Google Forms on Mobile Devices at UNACH.



Note. Taken by Nicole Lema (2026).

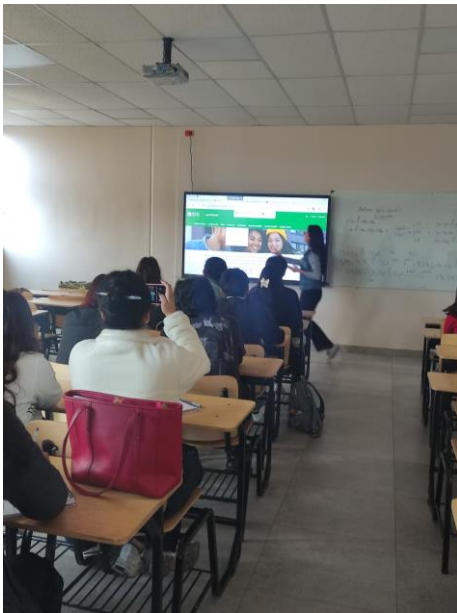
Students Being Introduced to Digital Tools for English Grammar Learning at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. García Riviera Dalesky Paulith	020224430		
2. Asunción Elizalde Andrea Estefanía	1105430304		
3. Contero Tamay Doménica Mercedes	0605937240		
4. Lema Lema Sara Anabel	0605767977		
5. Sanltan Milan Silvia	0202336954		
6. Verónica			
7. Delfino Anahi Vera Chingá	0850466477		
8. Ayal Puma Selena Stefanya	0605640113		
9. Ayal Uuco Jenny Nicol	0605224047		
10. Barahona Enriquez Henry Omar	0606121085		
11. Sanguucho De La Cruz Brywilda Adalberto	0504299454		
12. Ledín Aldema Lisidy Mayte	0605762046		
13. Ana Lia Lopez Zula	1250906342		
14. Brigitte Estefanía Morán Hicazgo	2300489739		
15. Jennifer Maritza Yaucan Gavilanes	0630148737		
16. Gómez Veloz Odalys Valeska	1250941687		
17. Tuzza Muñoz Alan Alberto	0606074656		
18. Lamea Vázquez Samara Alejandra	0606132843		
19. Merliñ Lopez Janina Alejandra	0604994334		
20. Guerrero Rodríguez Marlon Patricia	060454052-6		

Note. Taken by Nicole Lema (2026).

Students Practicing Present Simple Tense Using Digital Tools at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Paulith	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Esthelfania	1105620304	<i>[Signature]</i>	
3. Contera Tamay Doménica Mercedes	0605957240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Santillán Mián Silvia Verónica.	0202336954	<i>[Signature]</i>	
7. Dalno Anahi Vera Chingá	0850464477	<i>[Signature]</i>	
8. Ayala Puma Selena Stefanya	0605840113	<i>[Signature]</i>	
9. Ayala Luco Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Sarachona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Brysaida Adalia	0504299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lia Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefania Morán Hualgo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gaviranes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valeska	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Larrea Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merin Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Gutierrez Rodriguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Present Continuous Tense Using Digital Tools at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Paulith	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Esthelfania	1105620304	<i>[Signature]</i>	
3. Contera Tamay Doménica Mercedes	0605957240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Santillán Mián Silvia Verónica.	0202336954	<i>[Signature]</i>	
7. Dalno Anahi Vera Chingá	0850464477	<i>[Signature]</i>	
8. Ayala Puma Selena Stefanya	0605840113	<i>[Signature]</i>	
9. Ayala Luco Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Sarachona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Brysaida Adalia	0504299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lia Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefania Morán Hualgo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gaviranes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valeska	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Larrea Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merin Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Gutierrez Rodriguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Past Simple Tense Using Digital Tools at UNACH



Last Names and first Names	ID Number	Signature	Comment
1. García Rivera Dalesky Paulith	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105420304	<i>[Signature]</i>	
3. Contero Tamay Doménica Mercedes	0405937240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Sanitán Mián Silvia	0202336954	<i>[Signature]</i>	
6. Verónica			
7. Dolfo Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayol Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayol Luco Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Sarahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Bryselda Adolfo	0304299454	<i>[Signature]</i>	
12. León Akulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Marín Hidalgo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gaviranes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valenka	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Lareca Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlin Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Past Continuous Tense Using Digital Tools at UNACH



Last Names and first Names	ID Number	Signature	Comment
1. García Rivera Dalesky Paulith	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105420304	<i>[Signature]</i>	
3. Contero Tamay Doménica Mercedes	0405937240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Sanitán Mián Silvia	0202336954	<i>[Signature]</i>	
6. Verónica			
7. Dolfo Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayol Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayol Luco Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Sarahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Bryselda Adolfo	0304299454	<i>[Signature]</i>	
12. León Akulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Marín Hidalgo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gaviranes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valenka	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Lareca Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlin Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Future Forms (Will vs. Going to) Using Digital Tools at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Paulieth	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105620304	<i>[Signature]</i>	
3. Cóntero Tamay Doménica Mercedes	060957240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	060576797	<i>[Signature]</i>	
5. Samirán Mián Silvia 6. Verónica	0202356954	<i>[Signature]</i>	
7. Dafne Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayol Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayol Luco Jenny Nicol	0605224047	<i>[Signature]</i>	
10. Barahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Bryselda Adalá	0504299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Morán Hazaigo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gavilanes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valenka	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Lamea Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlín Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	0604540524	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Quantifiers Using Digital Tools at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Paulieth	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105620304	<i>[Signature]</i>	
3. Cóntero Tamay Doménica Mercedes	060957240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	060576797	<i>[Signature]</i>	
5. Samirán Mián Silvia 6. Verónica	0202356954	<i>[Signature]</i>	
7. Dafne Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayol Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayol Luco Jenny Nicol	0605224047	<i>[Signature]</i>	
10. Barahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sangucho De La Cruz Bryselda Adalá	0504299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía Lopez Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Morán Hazaigo	2350489759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gavilanes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valenka	1250941687	<i>[Signature]</i>	
17. Tuaza Muñoz Alan Alberto	0606074656	<i>[Signature]</i>	
18. Lamea Vázquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlín Lopez Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	0604540524	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Practicing Modal Verbs (Must / Should) Using Digital Tools at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Pauleth	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105420304	<i>[Signature]</i>	
3. Contero Tamay Doménica Mercedes	0605937240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Santibán Mián Silvia	0202336954	<i>[Signature]</i>	
6. Verónica		<i>[Signature]</i>	
7. Dolfo Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayala Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayala Ucuo Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Barahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sanguchá De La Cruz Bryselda Adalía	0904299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía López Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Morán Hidalgo	2350499759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gavilanes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valerika	1250941687	<i>[Signature]</i>	
17. Tuzza Muñoz Alan Alberto	0603074656	<i>[Signature]</i>	
18. Larrea Váscquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlín López Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Students Completing the English Grammar Post-Test and Perception Questionnaire Using Google Forms at UNACH



Last Names and First Names	ID Number	Signature	Comment
1. Garcia Riviera Dalesky Pauleth	020224430	<i>[Signature]</i>	
2. Asunción Elizalde Andrea Estefanía	1105420304	<i>[Signature]</i>	
3. Contero Tamay Doménica Mercedes	0605937240	<i>[Signature]</i>	
4. Lema Lema Sara Anabel	0605767697	<i>[Signature]</i>	
5. Santibán Mián Silvia	0202336954	<i>[Signature]</i>	
6. Verónica		<i>[Signature]</i>	
7. Dolfo Anahí Vera Chingá	0850446477	<i>[Signature]</i>	
8. Ayala Puma Selena Stefanya	0605840115	<i>[Signature]</i>	
9. Ayala Ucuo Jenny Nicol	0603224047	<i>[Signature]</i>	
10. Barahona Enriquez Henry Omar	0606121085	<i>[Signature]</i>	
11. Sanguchá De La Cruz Bryselda Adalía	0904299454	<i>[Signature]</i>	
12. León Alulema Leidy Mayte	0605762046	<i>[Signature]</i>	
13. Ana Lía López Zula	1250906342	<i>[Signature]</i>	
14. Brigitte Estefanía Morán Hidalgo	2350499759	<i>[Signature]</i>	
15. Jennifer Maritza Yaucan Gavilanes	0650148737	<i>[Signature]</i>	
16. Gómez Veloz Odalys Valerika	1250941687	<i>[Signature]</i>	
17. Tuzza Muñoz Alan Alberto	0603074656	<i>[Signature]</i>	
18. Larrea Váscquez Samara Alejandra	0606132843	<i>[Signature]</i>	
19. Merlín López Janina Alejandra	0604989434	<i>[Signature]</i>	
20. Guerrero Rodríguez Marlon Patricia	060454052-6	<i>[Signature]</i>	

Note. Taken by Nicole Lema (2026).

Annex 10. Digital Tools

LearnEnglish Grammar App Interface (British Council)

The screenshot displays the website interface for the LearnEnglish Grammar App. At the top, there is a purple navigation bar with the British Council logo on the left and menu items: 'Free resources', 'Online courses', 'IELTS preparation', and 'Level test'. On the right side of the bar are 'Search', 'Log in', and 'Register' buttons. Below the navigation bar, the breadcrumb trail reads 'Free resources > Grammar > A1-A2 grammar'. The main heading is 'A1-A2 grammar'. To the right of the heading is a list of links: 'A1-A2 grammar', 'B1-B2 grammar', 'C1 grammar', and 'English grammar reference'. Below the heading is a large image of a woman sitting at a desk, writing in a notebook. To the right of this image is a smaller image of a woman working at a laptop in a library. Below the smaller image are the links 'Online courses' and 'Our websites'.

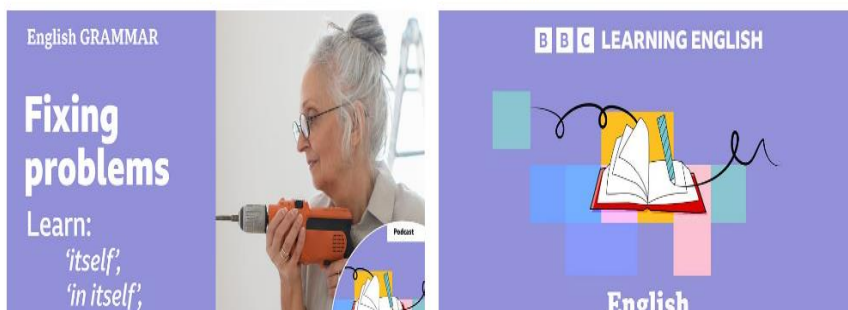
Note. From LearnEnglish Grammar (Version 4.0), by British Council, 2024 (<https://learnenglish.britishcouncil.org/free-resources/grammar/a1-a2>). Copyright 2024 by British Council.



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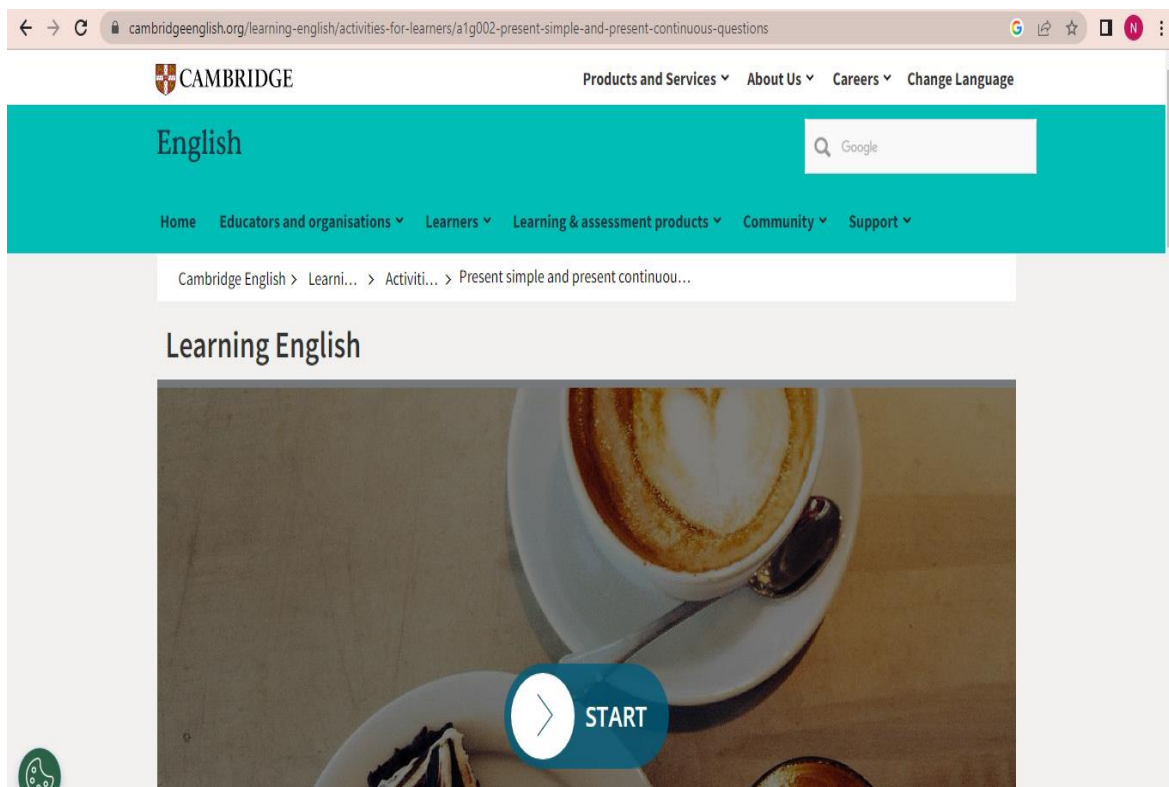
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Note. From BBC Learning English (Version 3.0), by British Broadcasting Corporation, 2024 (<https://www.bbc.co.uk/learningenglish/english/grammar>). Copyright 2024 by British Broadcasting Corporation.

English Grammar in Use App Interface (Cambridge University Press)



Note. From English Grammar in Use (Version 1.0), by Cambridge University Press, 2024 (<https://www.cambridgeenglish.org/learning-english/activities-for-learners/a1g002-present-simple-and-present-continuous-questions>). Copyright 2024 by Cambridge University Press.