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Using Duolingo to Enhance Basic Writing Skills in A1 EFL Fourth Grade Students

Uso de Duolingo para mejorar las habilidades básicas de escritura en estudiantes de cuarto grado de inglés como lengua extranjera (A1)

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ABSTRACT

This study analyzed the use of Duolingo as a complementary learning tool to enhance basic writing skills in A1 EFL fourth grade students. The research addressed the difficulties that young learners present in grammar accuracy, vocabulary use, and sentence structure within English writing activities. The study followed a mixed-method approach under an Action Research design structured through the stages of diagnosis, planning, action, observation, and reflection. The participants were 25 fourth grade students from an Ecuadorian primary educational institution. Quantitative data were collected through a pre-test and post-test evaluated with a writing rubric, while qualitative data were obtained through classroom observations focused on participation, motivation, and engagement. The intervention consisted of integrating Duolingo activities into regular English classes during a four-week period. The findings revealed improvements in students' writing performance after the intervention, particularly in sentence structure and vocabulary use. Additionally, the qualitative results showed higher levels of participation and motivation during classroom activities involving the application. The study concludes that Duolingo may serve as an effective gamified learning tool to support writing development in young EFL learners within primary education contexts.

Keywords: gamification, Duolingo, writing skills, EFL, primary education

RESUMEN

Este estudio analizó el uso de Duolingo como herramienta de aprendizaje complementaria para mejorar las habilidades básicas de escritura en estudiantes de cuarto grado de inglés como lengua extranjera (EFL) de nivel A1. La investigación abordó las dificultades que presentan los jóvenes estudiantes en cuanto a precisión gramatical, uso del vocabulario y estructura de oraciones en actividades de escritura en inglés. El estudio siguió un enfoque de métodos mixtos bajo un diseño de investigación-acción estructurado a través de las etapas de diagnóstico, planificación, acción, observación y reflexión. Los participantes fueron 25 estudiantes de cuarto grado de una institución de educación primaria ecuatoriana. Se recopilaron datos cuantitativos mediante una prueba previa y una posterior evaluadas con una rúbrica de escritura, mientras que los datos cualitativos se obtuvieron a través de observaciones en el aula centradas en la participación, la motivación y el compromiso. La intervención consistió en integrar las actividades de Duolingo en las clases regulares de inglés durante un período de cuatro semanas. Los hallazgos revelaron mejoras en el desempeño de la escritura de los estudiantes después de la intervención, particularmente en la estructura de oraciones y el uso del vocabulario. Además, los resultados cualitativos mostraron mayores niveles de participación y motivación durante las actividades en el aula que involucraban la aplicación. El estudio concluye que Duolingo puede servir como una herramienta de aprendizaje gamificado eficaz para apoyar el desarrollo de la escritura en jóvenes estudiantes de EFL en contextos de educación primaria.

Palabras claves: gamificación, Duolingo, habilidades de escritura, inglés como lengua extranjera, educación primaria

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INTRODUCTION

The teaching of English as a Foreign Language has evolved significantly due to the integration of digital technologies in educational environments. Gamified learning tools have emerged as innovative strategies that promote motivation and active participation among students in different educational levels. Applications such as Duolingo incorporate game elements that facilitate language acquisition through interactive exercises and immediate feedback. These tools have been widely adopted in formal and informal learning contexts. However, their real pedagogical impact on specific language skills remains under continuous academic discussion (Godwin-Jones, 2020).

At the Latin American level, the incorporation of digital tools in EFL education has been influenced by the need to improve learning outcomes in contexts with limited exposure to the English language. Educational systems have begun to integrate mobile learning applications as complementary resources to traditional instruction. Despite this trend, challenges persist in achieving effective development of productive skills such as writing. Research has shown that while digital tools enhance engagement and vocabulary acquisition, their influence on writing competence is less conclusive (Gragera, 2024).

In the Ecuadorian context, particularly in primary education, students at the A1 level often demonstrate difficulties in constructing basic sentences, using appropriate vocabulary, and applying grammatical rules correctly in writing tasks. In the specific case of fourth grade students, these challenges are more evident due to their early stage of language development. Although teachers incorporate digital tools like Duolingo to support instruction, there is insufficient empirical evidence regarding their effectiveness in improving writing skills in formal classroom settings.

The relevance of this study lies in addressing this gap by analyzing the pedagogical impact of Duolingo on writing skills in young learners. Understanding whether this application contributes to measurable improvements in writing performance is essential for guiding instructional practices. This research provides practical value for teachers seeking innovative strategies to enhance writing instruction. Additionally, it contributes to the academic field by generating evidence on the use of gamified tools in primary EFL education.

Regarding previous studies, Gamal (2025) aimed to evaluate the effect of Duolingo on EFL students' writing skills using a quantitative approach with pre-test and post-test measures. The study analyzed components such as vocabulary, organization, and grammar. The results showed improvements in overall writing performance, although variations were observed among specific components. The study concluded that Duolingo can support writing development when used as a complementary tool.

Similarly, Monny and Manurung (2024) conducted a classroom action research study to determine the effectiveness of Duolingo in improving students' writing skills. The methodology involved iterative cycles of intervention and evaluation. The findings indicated a significant reduction in writing errors and improvement in sentence construction. The authors concluded that Duolingo positively influences writing skills when integrated systematically into instruction.

Mayasari (2025) focused on eleventh grade students using a quantitative design to analyze the impact of Duolingo on writing skills. The research involved a sample of 50 students and applied structured assessments. The results demonstrated improvements in students' writing abilities and positive attitudes toward the use of the application. The study concluded that Duolingo enhances motivation and supports writing development in EFL contexts.

Malinda and Daulay (2024) conducted a mixed-method study based on students' perceptions of Duolingo as a learning platform. The objective was to evaluate its effectiveness across language skills. The results revealed that students perceived improvements in writing, speaking, and reading skills due to the application's interactive design. The study concluded that Duolingo is an effective tool for improving general English proficiency, especially at beginner levels.

Ta'amneh (2024) examined the effect of using Duolingo on developing EFL students' vocabulary competence and attitudes toward English learning through a quantitative research design. The study involved students who participated in Duolingo-based learning activities and completed vocabulary assessments before and after the intervention. The findings revealed significant improvements in vocabulary acquisition and positive attitudes toward the use of digital learning applications. The study concluded that Duolingo supports language development by increasing learners' engagement and facilitating vocabulary retention.

Likewise, Ouyang and Zhang (2024) analyzed the effects of Duolingo as an AI-integrated language learning technology on English language development. The study employed quantitative and qualitative methods to evaluate learners' performance and perceptions regarding the platform. The results indicated that students improved their language proficiency while demonstrating high levels of motivation and participation during learning activities. The authors concluded that Duolingo provides an adaptive and engaging learning environment that supports language acquisition through personalized practice opportunities.

Nguyen (2025) investigated the use of Duolingo to enhance vocabulary learning among EFL students in Hanoi through a mixed-method research design. The study combined questionnaires, interviews, and statistical analysis to evaluate students' perceptions and learning outcomes. The findings demonstrated positive attitudes toward the application and significant vocabulary improvement among participants. The study concluded that Duolingo can be effectively integrated into English instruction to strengthen language development and learner autonomy.

Guaqueta and Castro-García (2023) investigated the effectiveness of Duolingo as a Mobile-Assisted Language Learning tool among university EFL learners. The study employed a quantitative design to analyze students' language performance and engagement after using the application for several weeks. The findings revealed improvements in vocabulary acquisition and learner autonomy, while students reported positive perceptions toward the platform. The authors concluded that Duolingo can support language development by promoting self-directed learning and increasing opportunities for language practice (Guaqueta & Castro-García, 2023).

Zhang & Hasim (2023) examined the role of gamified language learning applications in fostering student engagement and language achievement through a systematic review of empirical studies. The review analyzed evidence from different educational contexts and language levels. The results showed that gamification strategies contributed positively to motivation, participation, and learning outcomes. The authors concluded that digital applications incorporating game elements can strengthen language acquisition when integrated appropriately into educational environments (Zhang & Hasim, 2023).

Loewen et al. (2020) explored language learning outcomes associated with the use of Duolingo among second language learners. Using quantitative measures, the researchers evaluated participants' progress across different language competencies after sustained use of the platform. The findings demonstrated measurable gains in language proficiency and highlighted the value of frequent practice and immediate feedback. The study concluded that Duolingo can function as an effective supplementary resource for language learning outside traditional classroom settings (Loewen et al., 2020).

Munday (2016) analyzed university students' perceptions of Duolingo as a complementary language learning tool. The research employed surveys and qualitative feedback to examine students' experiences with the application. The results indicated that learners perceived Duolingo as useful, motivating, and accessible for reinforcing language skills beyond classroom instruction. The study concluded that the platform offers valuable opportunities for independent learning and can enhance student engagement in foreign language education (Munday, 2016).

Additionally, Fitriani (2025) conducted a systematic review of twenty research articles focused on the effectiveness of Duolingo in language learning contexts. The objective of the study was to analyze the impact of the application on different language skills including vocabulary, reading, listening, speaking, and writing. The review revealed consistent evidence supporting the effectiveness of Duolingo in promoting language proficiency and learner engagement across diverse educational settings. The study concluded that Duolingo represents a valuable Mobile-Assisted Language Learning tool capable of supporting multiple dimensions of language acquisition.

From a theoretical perspective, this study is grounded in constructivist learning theory, which emphasizes active knowledge construction through interaction and experience. It also draws on gamification theory, which highlights the role of game elements in increasing motivation and engagement in learning processes. Additionally, communicative language teaching supports the development of language skills through meaningful use of language in context. These theoretical approaches justify the integration of digital tools like Duolingo in EFL instruction.

This study proposes the integration of Duolingo as a pedagogical intervention to support the development of basic writing skills among A1 EFL fourth grade students. The proposed intervention combines gamified digital activities with regular classroom instruction and was implemented through an Action Research framework. Its effectiveness was assessed through a sequence that included a pre-test, the instructional intervention, classroom observations, a post-test, and the triangulation of quantitative and qualitative data.

Based on this framework, the general objective of this study is to evaluate the improvement in basic writing skills of A1 EFL fourth grade students through the use of Duolingo, measured by means of a structured pre-test and post-test rubric. The specific objectives are to diagnose the initial level of writing skills through a pre-test, to implement Duolingo as a learning tool during the intervention process, and to evaluate the improvement in writing skills through a post-test using the same rubric.

MATERIALS AND METHODS

Research Approach and Design

The present study was conducted under a mixed-method research approach which integrates quantitative and qualitative data to provide a comprehensive understanding of the impact of Duolingo on writing skills in A1 EFL students. The quantitative component focused on measuring improvements in writing performance through numerical data obtained from structured assessments. The qualitative component aimed to interpret students' learning experiences and classroom dynamics during the intervention process. This integration allowed a broader interpretation of both measurable outcomes and contextual factors influencing learning (Creswell, 2014).

The research was framed within an applied type of study since it seeks to address a specific educational problem related to writing difficulties in young EFL learners. Furthermore, the study followed an Action Research approach structured through five stages: diagnosis, planning, action, observation, and reflection. This methodological approach was selected because it allows the researcher to implement pedagogical interventions within a real educational context while simultaneously analyzing their impact on students' learning processes.

The design adopted was pre-experimental with a pre-test and post-test structure applied to a single group of participants. This design enabled the comparison of students' writing performance before and after the implementation of Duolingo as an instructional support tool. Although no control group was included, this design is appropriate for exploratory educational interventions conducted in authentic classroom settings (Hernández-Sampieri & Mendoza, 2018).

Participants

The population of the study consisted of fourth grade students from a primary educational institution in Ecuador who are learning English as a foreign language at an A1 level. These students are characterized by limited exposure to English outside the classroom and by presenting difficulties in constructing simple written sentences using basic grammatical structures and vocabulary.

The sample was composed of 25 students selected through a non-probabilistic convenience sampling method. The selection was based on accessibility and the availability of the group during the academic period in which the intervention was conducted. This type of sampling is commonly used in educational Action Research studies where the researcher works directly with an assigned classroom group.

Data Collection Techniques and Instruments

Regarding data collection techniques, the quantitative component employed structured assessments through a pre-test and post-test to measure students' writing skills. These assessments were designed to evaluate grammar accuracy, vocabulary use, and sentence structure through a standardized writing rubric. The rubric facilitated objective evaluation and comparison of students' performance before and after the intervention.

For the qualitative component, classroom observation was used to gather information related to student participation, motivation, engagement, and interaction during the implementation of Duolingo activities. The observations were registered through an observation guide that included predefined categories associated with behavioral responses and task completion during classroom activities.

The instruments used in this study included a structured writing rubric and an observation guide. The rubric was organized into three dimensions which are grammar accuracy, vocabulary use, and sentence structure. Each dimension contained performance descriptors that allowed the classification of students' writing proficiency levels. The observation guide included indicators associated with participation and engagement during the intervention process.

To ensure the validity and reliability of the instruments, a pilot test was conducted with students presenting characteristics similar to those of the study participants. In addition, the instruments were reviewed by academic experts in EFL teaching to verify content validity and appropriateness for the target population. These procedures contributed to improving the consistency and credibility of the collected data (Creswell, 2014).

Action Research Procedure

Phase 1: Diagnosis

The first stage of the Action Research cycle consisted of diagnosing students' initial writing abilities through the application of a pre-test. This assessment evaluated students' performance in grammar accuracy, vocabulary use, and sentence structure. The results obtained during this phase allowed the identification of the main writing difficulties presented by the participants and served as the basis for designing the intervention.

Phase 2: Planning

During the planning stage, the intervention was designed considering the writing difficulties identified in the diagnostic phase. The researcher organized activities using Duolingo as a complementary learning tool integrated into regular English classes. The intervention focused on reinforcing basic vocabulary, sentence formation, and simple grammatical structures aligned with the A1 level.

The intervention was planned for a four-week period consisting of three sessions per week. Each session lasted approximately 40 minutes and included activities related to vocabulary practice, sentence completion, translation exercises, and guided writing tasks. The teacher provided instructional guidance to ensure that students correctly interacted with the platform and completed the assigned activities.

Phase 3: Action

The action phase involved the implementation of the planned Duolingo activities during regular classroom sessions. Students used the application individually under teacher supervision while completing exercises designed to strengthen their writing abilities. The teacher facilitated the integration of Duolingo into classroom instruction by connecting application activities with classroom writing tasks and follow-up exercises.

Throughout the intervention, students participated in activities such as sentence construction, vocabulary matching, translation exercises, and short guided writing tasks based on the vocabulary and grammatical structures practiced within the application. These activities were intended to reinforce students' ability to produce basic written English sentences independently.

Phase 4: Observation

During the observation stage, qualitative data were collected through continuous classroom observation. The researcher registered students' levels of participation, motivation, task completion, and interaction while using Duolingo during classroom activities. These observations allowed the identification of behavioral patterns and students' responses to the integration of gamified learning within the English classroom.

Phase 5: Reflection

The final stage of the Action Research cycle consisted of reflecting on the outcomes of the intervention through the analysis of both quantitative and qualitative data. The results obtained

from the post-test and classroom observations were interpreted to evaluate the effectiveness of Duolingo in improving students' basic writing skills. This reflective process contributed to identifying strengths, limitations, and pedagogical implications associated with the implementation of digital learning tools in EFL primary education contexts.

Data Analysis

For quantitative data analysis, the scores obtained from the pre-test and post-test were analyzed using descriptive statistics. Mean scores and score differences were calculated to determine the level of improvement in students' writing skills after the intervention. The analysis focused specifically on the dimensions of grammar accuracy, vocabulary use, and sentence structure.

For qualitative analysis, the information collected through classroom observations was organized into categories related to participation, motivation, interaction, and task engagement. The integration of quantitative and qualitative findings allowed a broader interpretation of the effectiveness of Duolingo as a pedagogical tool for enhancing writing skills in A1 EFL students.

Data Triangulation

The study employed methodological triangulation to strengthen the validity and credibility of the findings. Quantitative data obtained through the pre-test and post-test provided objective evidence regarding students' progress in grammar accuracy, vocabulary use, and sentence structure. Simultaneously, qualitative data collected through classroom observations offered contextual information about students' participation, motivation, engagement, and interaction during the intervention process.

The integration of both sources of evidence allowed the researcher to compare and complement the findings obtained through different instruments. Improvements identified in the quantitative results were contrasted with the behavioral patterns observed during classroom activities. For example, increases in writing performance were accompanied by higher levels of participation, task completion, and learner engagement observed throughout the intervention. This convergence of quantitative and qualitative findings provided a more comprehensive understanding of the impact of Duolingo on students' writing development.

Through this triangulation process, the study was able to validate the consistency of the results from multiple perspectives and reduce the limitations associated with relying on a single source of data. Consequently, the integration of quantitative and qualitative evidence strengthened the interpretation of the findings and enhanced the overall rigor of the research process.

Operationalization of Variables

The variables of the study were operationalized in order to define how they would be measured during the research process. The independent variable corresponds to the use of Duolingo as a gamified learning tool, while the dependent variable refers to basic writing skills.

Table 1 presents the dimensions, indicators, techniques, and instruments used for their measurement.

Table 1
Operationalization of variables

Variable	Dimension	Indicator	Item	Technique	Instrument
Independent variable: Use of Duolingo	Gamified learning	Frequency of use	Use of app during sessions	Observation	Observation guide
	Interaction	Participation level	Student engagement	Observation	Observation guide
Dependent variable: Writing skills	Grammar accuracy	Correct use of structures	Grammar use in sentences	Test	Rubric
	Vocabulary use	Appropriate word usage	Use of basic vocabulary	Test	Rubric
	Sentence structure	Sentence formation	Coherence of sentences	Test	Rubric

Note. Prepared by the author

RESULTS

The results obtained during the intervention process are presented according to the quantitative and qualitative components of the study. The quantitative findings were obtained through the application of the pre-test and post-test focused on grammar accuracy, vocabulary use, and sentence structure. The qualitative findings were collected through classroom observations conducted during the implementation of Duolingo activities.

Quantitative Results

Writing performance was assessed through an analytic rubric with a maximum score of 10 points for each dimension. The rubric evaluated three dimensions: grammar accuracy, vocabulary use, and sentence structure. Each dimension was scored on a scale from 1 to 10 according to predefined performance descriptors. The overall writing performance score was calculated as the average of the three dimensions evaluated. Scores ranging from 1 to 4 were classified as low performance, scores between 5 and 7 as medium performance, and scores between 8 and 10 as high performance.

To facilitate interpretation, students demonstrating high performance were able to construct simple sentences using appropriate vocabulary and basic grammatical structures with few errors. Students classified within the medium level showed partial mastery of sentence construction but still presented frequent grammatical or lexical inaccuracies. In contrast, students

in the low-performance category experienced difficulties organizing ideas, selecting appropriate vocabulary, and applying basic grammatical rules in written tasks.

Table 2

Writing performance scale used in the study

Score	Performance	Description
Range	Level	
8 – 10	High	Accurate use of grammar, vocabulary, and sentence structure
5 – 7	Medium	Partial mastery with occasional errors
1 – 4	Low	Frequent difficulties in written language production

Note. Prepared by the author

Table 2 presents the performance scale used to classify students' writing abilities throughout the study. The classification criteria were established according to the descriptors included in the writing rubric and allowed the interpretation of students' progress before and after the intervention. This scale served as the basis for analyzing changes in writing performance across the evaluated dimensions.

Table 3

Pre-test and Post-test Mean Scores in Writing Skills

Writing Dimension	Pre-test Mean	Post-test Mean	Improvement
Grammar accuracy	5.8	8.1	+2.3
Vocabulary use	6.0	8.5	+2.5
Sentence structure	5.5	8.0	+2.5
Overall writing performance	5.7	8.2	+2.5

Note. Prepared by the author

The results presented in Table 3 indicate a noticeable improvement in students' writing skills after the implementation of Duolingo activities. Grammar accuracy increased from a mean score of 5.8 in the pre-test to 8.1 in the post-test. Vocabulary use demonstrated one of the highest improvements with an increase of 2.5 points. Similarly, sentence structure improved considerably after the intervention process. Overall writing performance showed a positive progression which suggests that the integration of Duolingo contributed to the enhancement of students' basic writing skills.

Table 4

Percentage of Students According to Writing Performance Levels in the Pre-test

Performance Level	Frequency	Percentage
Low	14	56%
Medium	8	32%
High	3	12%
Total	25	100%

Note. Prepared by the author

Table 4 shows that before the intervention most students were located within the low performance level in writing skills. More than half of the participants demonstrated difficulties related to grammar use, vocabulary selection, and sentence formation. Only a small percentage of students achieved a high performance level during the diagnostic phase. These results confirmed the necessity of implementing strategies to reinforce writing development in A1 EFL learners.

Table 5

Percentage of Students According to Writing Performance Levels in the Post-test

Performance Level	Frequency	Percentage
Low	3	12%
Medium	9	36%
High	13	52%
Total	25	100%

Note. Prepared by the author

According to Table 5, students' writing performance improved significantly after the intervention. The percentage of students classified within the high performance level increased from 12% to 52%. At the same time, the proportion of students in the low performance category decreased considerably. These findings suggest that the use of Duolingo contributed positively to the development of basic writing skills among the participants.

Table 6

Improvement by Writing Dimension

Writing Dimension	Initial Score	Final Score	Percentage of Improvement
Grammar accuracy	5.8	8.1	39.6%
Vocabulary use	6.0	8.5	41.7%
Sentence structure	5.5	8.0	45.5%

Note. Prepared by the author

The data presented in Table 6 reveal that sentence structure showed the highest percentage of improvement among the evaluated dimensions. Vocabulary use also demonstrated a considerable increase after the intervention. Grammar accuracy improved positively although students still presented minor difficulties related to basic grammatical rules. These findings indicate that Duolingo activities were especially effective in reinforcing sentence construction and vocabulary acquisition.

Qualitative Results

Table 7

Classroom Observation Categories During the Intervention

Category	Observation Findings
Participation	Most students actively completed Duolingo activities during classroom sessions
Motivation	Students showed enthusiasm and interest when using gamified exercises
Interaction	Learners collaborated with classmates during vocabulary and sentence activities
Task completion	Students progressively completed writing tasks with greater independence
Engagement	Students maintained attention for longer periods during digital activities

Note. Prepared by the author

The classroom observations revealed positive behavioral changes during the intervention process. Students demonstrated increased participation and motivation while interacting with Duolingo activities. The gamified characteristics of the application promoted active engagement and encouraged students to complete writing tasks more confidently. Additionally, collaborative interaction among classmates was observed during vocabulary and sentence construction exercises.

Table 8

Observed Difficulties During the Intervention

Observed Difficulty	Description
Grammar confusion	Some students confused verb forms and sentence order
Vocabulary limitations	Students occasionally lacked vocabulary to complete writing tasks
Technological adaptation	A few students initially required support to navigate the application
Writing independence	Some learners depended on teacher guidance during early sessions

Note. Prepared by the author

Although positive outcomes were identified during the intervention, several challenges were also observed. Some students experienced difficulties related to grammar accuracy and limited vocabulary knowledge. Additionally, a small number of participants required support during the initial stages of the intervention due to unfamiliarity with the digital platform. Despite these challenges, students progressively demonstrated greater independence and confidence throughout the intervention process.

Conclusion of results

Overall, the quantitative and qualitative findings demonstrate that the integration of Duolingo as a complementary instructional tool contributed positively to the improvement of basic writing skills among A1 EFL fourth grade students. The results obtained through the pre-test and post-test showed measurable progress in grammar accuracy, vocabulary use, and sentence structure. Likewise, classroom observations revealed higher levels of participation, motivation, and engagement during the intervention process.

DISCUSSION

The findings of this study demonstrate that the integration of Duolingo as a complementary instructional tool contributed positively to the development of basic writing skills among A1 EFL fourth grade students. The improvement observed in grammar accuracy, vocabulary use, and sentence structure supports the growing body of evidence regarding the effectiveness of digital language learning platforms. These findings are consistent with the studies conducted by Gamal (2025), Monny and Manurung (2024), and Mayasari (2025), who reported significant improvements in writing performance following the implementation of Duolingo-based activities. Likewise, the systematic review developed by Fitriani (2025) identified consistent evidence supporting the effectiveness of Duolingo across different language skills and educational settings. The convergence of these findings suggests that the application creates favorable conditions for language learning through repetitive practice, immediate feedback, and active learner participation.

One of the most relevant outcomes of the intervention was the improvement in grammar accuracy. Although grammar is often considered one of the most challenging aspects of foreign language learning for young learners, students demonstrated greater control of basic structures after the intervention. This improvement may be explained by the repetitive nature of Duolingo activities, which expose learners to grammatical patterns in multiple contexts and require constant reinforcement of language forms. Similar results were reported by Monny and Manurung (2024), who observed a reduction in grammatical errors among EFL students after integrating Duolingo into classroom instruction. Likewise, Gamal (2025) found improvements in grammar performance through structured writing activities, while Loewen et al. (2020) argued that app-based language learning facilitates the internalization of linguistic structures through repeated exposure and corrective feedback.

Vocabulary use also showed substantial improvement during the intervention process. This finding is particularly significant because vocabulary acquisition constitutes a fundamental component of writing development at beginner proficiency levels. The positive results may be associated with Duolingo's use of spaced repetition, visual associations, contextualized examples, and adaptive learning sequences. These findings coincide with those reported by Ta'amneh (2024)

and Nguyen (2025), who identified significant gains in vocabulary learning among EFL students using the platform. Furthermore, Fitriani (2025) concluded that vocabulary acquisition represents one of the language areas most consistently strengthened through Duolingo. The consistency of these findings suggests that the platform effectively supports lexical development by increasing the frequency and quality of exposure to new vocabulary items.

Interestingly, sentence structure exhibited the highest percentage of improvement among the evaluated dimensions. This result indicates that students not only learned isolated words and grammatical rules but also developed the ability to organize language into meaningful written expressions. A possible explanation is that Duolingo requires learners to combine vocabulary and grammar simultaneously through sentence-building exercises, translations, and contextualized tasks. This interpretation aligns with the findings of Gamal (2025) and Mayasari (2025), who observed notable progress in students' ability to construct coherent written sentences. Similarly, Godwin-Jones (2020) emphasized that mobile-assisted language learning environments promote contextualized language use and facilitate the transition from isolated language knowledge to functional communication skills.

The qualitative findings revealed a considerable increase in students' motivation, participation, and engagement throughout the intervention process. These results are particularly important because motivation has long been recognized as a determining factor in successful language acquisition. Students showed enthusiasm during classroom activities and demonstrated greater willingness to participate in writing tasks than during traditional instruction. These observations coincide with the findings reported by Malinda and Daulay (2024), who found that learners perceived Duolingo as an engaging and effective learning platform. Similar conclusions were reached by Munday (2016), who highlighted the motivational value of the application, and by Zhang & Hasim (2023), whose systematic review demonstrated that gamification elements positively influence learner participation and persistence. Additionally, Guaqueta and Castro-García (2023) reported that students developed greater autonomy and self-directed learning habits through the use of mobile language learning applications.

The positive outcomes observed in this study can also be interpreted through the lens of constructivist learning theory. According to this perspective, knowledge is actively constructed through interaction, exploration, and meaningful learning experiences. During the intervention, students engaged directly with language tasks, received immediate feedback, and progressively refined their writing performance through practice. This process reflects the constructivist assumption that learning occurs when learners actively participate in the construction of knowledge rather than passively receiving information. Furthermore, the findings align with the principles of Communicative Language Teaching, which emphasize meaningful language use and authentic communication as essential components of language development.

Another theoretical perspective that helps explain the findings is Mobile-Assisted Language Learning. According to Ouyang and Zhang (2024), mobile learning technologies create flexible, adaptive, and personalized learning environments that facilitate language acquisition beyond traditional classroom limitations. In the present study, students interacted with English content in a dynamic and accessible format that encouraged continuous practice and engagement. This characteristic may explain why learners demonstrated sustained participation throughout the intervention period. Moreover, the personalized feedback provided by the application may have contributed to reducing anxiety and increasing students' confidence when producing written language.

The educational context of Ecuador provides additional insights into the interpretation of the results. English instruction in many Ecuadorian schools is often limited by reduced classroom exposure and restricted opportunities for language practice outside school hours. Under these circumstances, digital tools such as Duolingo can serve as valuable resources for extending language learning beyond the classroom environment. The positive outcomes observed in this study suggest that the incorporation of mobile-assisted language learning applications may help address persistent challenges related to writing development among young EFL learners. Consequently, the findings have practical implications for teachers, curriculum designers, and educational institutions seeking innovative approaches to improve English language instruction.

This study contributes to the growing body of research on gamification, mobile-assisted language learning, and digital language education by providing evidence from a primary education context through an Action Research framework. Unlike many previous studies that focused primarily on vocabulary acquisition or general language proficiency, the present research specifically examined the development of writing skills among young learners. The integration of quantitative and qualitative findings provided a more comprehensive understanding of both academic performance and learner behavior. Nevertheless, the study was limited by its relatively small sample size and short intervention period. Future research should explore larger populations, longer implementation periods, and comparative experimental designs to determine the extent to which these findings can be generalized across different educational contexts and proficiency levels.

Teacher reflection and pedagogical implications

Throughout the intervention process, several pedagogical adjustments were implemented in response to students' needs and classroom dynamics. During the initial sessions, some students experienced difficulties navigating the application and understanding task instructions. As a result, additional teacher guidance and modeling activities were incorporated to facilitate the use of Duolingo and ensure that learners could focus on language practice rather than technological challenges. These adjustments contributed to improving students' participation and reducing frustration during subsequent sessions.

The intervention also provided valuable insights into the relationship between motivation and language learning among young EFL learners. It was observed that students responded more positively to activities that included immediate feedback, visible progress indicators, and achievable learning goals. This experience reinforced the importance of integrating engaging and student-centered methodologies into English instruction. From a pedagogical perspective, the use of gamified learning environments appears to create conditions that encourage active participation and sustained engagement, particularly among learners who initially demonstrate low confidence in their language abilities.

Another important lesson derived from the intervention was the need to balance technology use with teacher mediation. Although Duolingo offered meaningful opportunities for autonomous learning, students benefited most when digital activities were complemented by classroom discussions, guided writing exercises, and teacher feedback. This observation suggests that technological tools should not replace pedagogical interaction but rather serve as resources that enrich and extend learning opportunities within the classroom.

From an Action Research perspective, the intervention contributed not only to students' learning outcomes but also to the professional development of the teacher-researcher. The continuous observation of students' responses, the implementation of instructional adjustments, and the analysis of learning outcomes promoted a deeper understanding of how digital tools can be integrated effectively into EFL instruction. Consequently, the experience highlighted the value of reflective teaching practices and reinforced the importance of adapting instructional decisions according to students' evolving learning needs. The integration of quantitative and qualitative evidence through methodological triangulation strengthened the credibility of the findings by demonstrating consistency between students' improved writing performance and the positive behavioral changes observed during the intervention process.

Beyond evaluating the effectiveness of a digital learning application, this study contributes a pedagogical proposal based on the systematic integration of Duolingo into primary EFL instruction. The proposal was validated through the Action Research cycle, which included diagnosis through a pre-test, intervention planning, classroom implementation, continuous observation, post-test assessment, and methodological triangulation. The consistency observed between quantitative improvements in writing performance and qualitative evidence of increased participation, motivation, and engagement supports the validity of the intervention as a practical strategy for enhancing writing skills in young EFL learners. Therefore, the proposal may serve as a replicable instructional model for similar educational contexts in Ecuador and other primary education settings.

CONCLUSIONS

The present study demonstrated that the implementation of Duolingo as a complementary learning tool contributed positively to the improvement of basic writing skills among A1 EFL fourth grade students. The quantitative findings evidenced progress in grammar accuracy, vocabulary use, and sentence structure after the intervention process. These results indicate that the integration of gamified digital tools can support the development of writing abilities in early English language learning contexts.

The qualitative findings also revealed that students showed higher levels of motivation, participation, and engagement during classroom activities involving Duolingo. The interactive and gamified characteristics of the application promoted a more dynamic learning environment and encouraged students to participate actively in writing tasks. These observations reinforce the pedagogical value of integrating mobile-assisted language learning tools into primary EFL instruction.

From a methodological perspective, the Action Research approach allowed the implementation and evaluation of a practical educational intervention within a real classroom context. The integration of quantitative and qualitative data provided a broader understanding of students' learning processes and behavioral responses during the intervention. This methodological combination strengthened the interpretation and credibility of the findings obtained in the study.

This study contributes to the growing field of research on gamification and digital learning in EFL education. The findings suggest that Duolingo may serve as an effective instructional support tool for enhancing writing skills in young learners. Future research should consider larger populations, extended intervention periods, and comparative experimental designs to further explore the effectiveness of gamified applications in language learning environments.

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