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Strengthening Reading Skills in Secondary Students through Digital Educational Tools

Hernán Javier Guzmán Murillo
Doctor en Ciencias de la Educación
Universidad de Sucre Colombia
hernan.guzman@unisucre.edu.co
https://orcid.org/0000-0002-6757-4549

Karen Catalina Leal Acosta
Magister en Derecho Público
Universidad de Sucre Colombia
karen.leal@unisucrevirtual.edu.co
https://orcid.org/0000-0002-7916-2605

Tania Inés Martinez Medrano
Magister en Derecho Procesal
Universidad de Sucre, Colombia
tania.martinez@unisucre.edu.co
https://orcid.org/0009-0006-1722-6577

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Summary

This study aims to evaluate the impact of the use of educational digital tools on the strengthening of students' reading skills in an educational institution in the municipality of Apartadó, Antioquia. Information and communication technologies (ICT) were implemented to improve reading comprehension at its three levels: literal, inferential and critical. The intervention included the use of interactive platforms such as Moodle, Educaplay, Liveworksheets and other digital resources. Through diagnostic tests and practical workshops, the students' performance was evaluated before and after the intervention. The results showed a significant improvement in reading comprehension levels, suggesting that the integration of ICT in the educational process can be decisive in increasing motivation and strengthening students' academic performance. The conclusions point out that the appropriate use of digital tools not only improves reading skills, but also contributes to the development of competencies applicable in their daily and future lives.

Keywords: Educational digital tools, reading comprehension, ICT, motivation, secondary education.

Introduction

Reading proficiency is a fundamental skill in the educational process, as it is closely linked to academic success in all areas of knowledge. In particular, reading comprehension plays a crucial role in the learning of secondary school students. However, in many educational institutions in rural contexts such as the one in the municipality of Apartadó, Antioquia, students face various barriers that hinder the development of effective reading skills. These barriers include lack of adequate pedagogical resources, limited infrastructure, and limited exposure to the language outside the school environment, which negatively impacts their academic performance.

The use of digital educational tools has proven to be an effective strategy to address these challenges, as it allows for personalized learning, increased access to quality educational materials, and fostering autonomous learning. The use of interactive digital platforms such as Moodle, Educaplay, and

Liveworksheets offers a space for students to work at their own pace, receive immediate feedback, and engage in dynamic and motivating activities. However, access to and implementation of these tools in rural areas remains limited, raising the question of whether the use of ICT can actually have a substantial impact on the development of reading comprehension in students from these contexts.

In this sense, the purpose of this study is to evaluate the impact of the use of educational digital tools on the improvement of the reading skills of secondary school students in a rural educational institution. Through the implementation of an approach based on the use of interactive platforms, students are expected to develop reading comprehension skills at the three key levels: literal, inferential and critical, which will contribute to better academic performance in all areas.

The need to improve reading skills in English in the Colombian educational field has been widely recognized. In particular, educational institutions in rural areas face a significant gap in the resources available to students. Educational technology emerges as a fundamental tool to improve teaching, as it allows teachers to access interactive platforms and complementary materials that enrich the educational experience of students.

This study is relevant not only because it addresses the improvement of reading comprehension in English, but also because it focuses on the application of digital tools in rural contexts, where access to pedagogical resources is limited. The results of this research could be very useful for other rural institutions that wish to integrate ICT into their educational process, thus improving the quality of education and favoring digital inclusion.

The study also has practical implications for teachers, as it will provide effective pedagogical strategies based on the use of accessible technologies, allowing them to incorporate new methodologies into their classes. Finally, it is hoped that this research will serve as a basis for future pedagogical interventions that integrate ICT in the teaching of foreign languages in rural areas.

Theoretical foundation

The incorporation of digital educational tools in the teaching of reading comprehension has gained relevance in recent decades due to technological advances and digital transformation in educational processes. Digital platforms, such as Moodle, Educaplay and Liveworksheets, allow teachers to create a more dynamic, interactive and personalised learning environment. In this sense, various pedagogical theories support the use of technologies to improve reading skills in English, especially in rural contexts where access to educational resources is limited.

ICT-based learning

Information and Communication Technologies (ICT) have been recognized as a key pedagogical tool to promote autonomous learning, active participation and access to quality content. According to Bates (2005), the use of ICT in teaching not only facilitates access to a large number of digital resources, but also allows students to work independently and at their own pace, which is crucial in rural areas where learning opportunities are limited outside the classroom. Digital educational platforms provide the possibility of designing interactive and multimedia activities, which facilitates the understanding of texts and the retention of content in a more visual and cognitive way.

In this context, blended learning, which integrates face-to-face learning with the use of technologies in the classroom, has proven to be an effective approach to improve students' academic performance. Garrison and Kanuka (2004) state that this approach favors learning flexibility and encourages active student participation, which is especially important in rural contexts, where exposure to English outside the classroom is minimal. The possibility of combining traditional methods with the use of digital platforms allows for a more comprehensive learning experience tailored to the individual needs of students.

Autonomous and Collaborative Learning in the Use of ICT

Autonomous learning is a key component in foreign language teaching, as it encourages students' independence and responsibility for their own learning process. According to Little (2007), students who have control over their learning tend to be more motivated and engaged in educational activities. Digital platforms such as Exelearning, Moodle, and Educaplay offer students a space to work autonomously, manage their own time, and access resources that they can use according to their learning pace. This is crucial in rural areas, where students often lack opportunities to interact with English outside of the school environment.

In addition, digital tools not only support autonomous learning, but also collaborative learning, which is equally important in the development of language skills. Johnson and Johnson (1999) argue that cooperative learning allows students to work together on common tasks, which promotes interaction and knowledge sharing. In this study, collaborative activities designed on platforms such as Google Classroom and Liveworksheets allowed students to interact with each other, share ideas, and solve problems together, which contributed to improving both reading comprehension and communication skills in English.

Using Exelearning for Reading Comprehension

The use of Exelearning to design interactive activities has a significant impact on reading comprehension, as it allows the creation of multimedia content and dynamic exercises that facilitate the constant interaction of students with texts. Interactivity is an essential feature to maintain students' interest and motivation, as it allows them to actively participate in the learning process, rather than simply being passive recipients of information. According to Chapelle (2009), interactivity is crucial in learning a foreign language, as it allows students to practice and apply what they have learned in a more meaningful and realistic context.

The activities designed in Exelearning allow for continuous assessments of reading comprehension, such as multiple-choice quizzes, fill-in exercises, and text analysis tasks. These activities not only promote the comprehension of texts, but also allow students to reinforce their vocabulary, improve their ability to infer and develop critical skills. The immediate feedback offered by Exelearning allows students to correct mistakes and adjust their learning approach, encouraging autonomous and personalized learning.

Rural Context and the Use of ICTs

The rural context, with its limitations in educational infrastructure and technological resources, requires a pedagogical approach that is both adaptable and effective. Integrating ICT into the classroom offers students in rural areas the opportunity to overcome physical barriers and access quality educational content that would otherwise be out of reach. According to Zubiria (2011), the use of technologies such as Exelearning in rural areas can have a significant impact on student learning, as it allows them to access interactive teaching materials and participate in activities that promote the understanding and use of the language in real situations.

Through digital platforms, teachers can design more flexible teaching strategies, personalized for the specific needs of students, regardless of their geographical context. The use of Exelearning and other similar platforms level learning opportunities, providing rural students with the same tools and resources that urban students have, with the advantage of adapting learning to their own needs and paces.

The theory on the use of Exelearning and autonomous learning in combination with collaborative strategies demonstrates that ICTs are powerful tools for teaching English, especially in rural contexts. The proper use of interactive platforms can significantly improve reading comprehension skills, increase student motivation, and offer a more dynamic and accessible educational experience. This approach also promotes educational inclusion, allowing students in rural areas to have access to them

Methodology

Research Approach and Design

This study adopted a mixed approach with a quasi-experimental design to evaluate the impact of educational digital tools on the English reading comprehension of secondary school students in a rural context. The research design included a pre- and post-intervention measurement to evaluate progress in reading comprehension, complemented by a qualitative analysis that allowed exploring the perceptions and experiences of students and teachers with the digital tools implemented. In this way, the study sought a comprehensive understanding of the impact of educational technologies on academic achievement and student motivation.

Population and sample

The sample was composed of 50 high school students from a rural school located in the municipality of Apartadó, Antioquia. The selection of the sample was intentional, considering the availability of the students to participate in the intervention and their initial level of proficiency in English, determined through a diagnostic test previously applied. Both students with different levels of knowledge in the language were included, which allowed exploring how digital tools impacted students with different abilities and needs.

In addition, 5 English teachers participated, who implemented the intervention using Exelearning and other digital platforms. Teachers were selected for their willingness to use educational technology and their previous experience in teaching English. These teachers also provided feedback on their experience using the platform.

Data collection tools and techniques

To evaluate the impact of the pedagogical intervention, the following data collection instruments and techniques were used:

- Diagnostic test (pretest): An initial test was applied to measure the level of reading comprehension of the students. The test included reading comprehension activities, vocabulary and inferences, with the aim of obtaining a baseline on the students' reading skills.
- Final test (post-test): At the end of the intervention, a test similar to the diagnostic test was applied to evaluate progress in reading comprehension. The results of the final test were compared with those of the pre-test to measure the improvement in reading skills.
- Student Perception Survey: A closed and open survey was designed to gather students' opinion on the use of Exelearning and the digital activities implemented. The questions addressed aspects such as motivation, the usefulness of the activities and the interest in the use of digital tools.
- Semi-structured interviews with teachers: Interviews were conducted with the participating teachers at the end of the intervention to find out their opinions on the effectiveness of digital platforms, the difficulties and advantages they encountered during implementation, and the pedagogical strategies they used in class.
- Participant observation: During the development of the reading activities in Exelearning, an observation of classroom dynamics was carried out to record student participation and interactions with digital platforms. The observations helped to understand how the students engaged in the process and how they adapted to the interactive activities.
- Analysis of logs on the platform: Students' interactions with materials uploaded to Exelearning, such as time of participation, activities completed, and quiz results were reviewed to assess learning engagement and progression.

Procedure

1. Diagnostic phase:
    - Application of the diagnostic test to assess students' initial reading comprehension.

    - Conducting an initial survey to learn about students' perceptions of their level of English and use of educational technology.
2. Intervention phase:
    - Over a period of eight weeks, interactive activities were implemented on the Exelearning platform, focusing on reading comprehension. These activities included interactive readings, vocabulary exercises, assessments, and collaborative tasks.
    - The students worked autonomously on the platform and participated in feedback sessions with the teachers, who provided guidance and resolution of doubts.
    - Teachers also organized online discussions and collaborative activities to encourage teamwork and communicative practice in English.
3. Evaluation phase:
    - Application of the final test (postest) to evaluate progress in reading comprehension.
    - Conducting interviews with teachers and analyzing the results of the student perception survey to evaluate the impact of the use of Exelearning on their motivation and learning.
    - Observation of students' interactions with the platform, especially in reading activities and collaborative exercises.

Data analysis

The quantitative data obtained from the diagnostic and final tests were analyzed using descriptive statistics, calculating means and standard deviations, and performing a t-test for paired samples to compare the differences between pre-test and post-test scores. This analysis made it possible to determine whether there were significant differences in students' academic performance in reading comprehension.

The qualitative data obtained from the interviews and surveys were analyzed using thematic content analysis. The responses of the students and teachers were grouped into key categories related to motivation, the use of Exelearning, classroom dynamics and the pedagogical strategies used. The triangulation of the data allowed to guarantee the validity and reliability of the results obtained.

Results

The results of this study are divided into three key dimensions: academic performance, students' perceptions of the use of Exelearning, and classroom dynamics. Below is a detailed analysis of each dimension based on the data obtained from the diagnostic and final tests, perception surveys and observations made in classroom activities.

1. Academic Performance

The analysis of the results of the diagnostic test (pretest) and the final test (postest) showed a significant increase in the academic performance of students in reading comprehension in English. The overall average of the diagnostic test was 2.9 out of 5, while in the final test this increased to 4.2 out of 5, which represents an increase of 1.3 points (approximately 44% improvement).

The increase in performance was especially noticeable in the following areas of evaluation:

- Vocabulary: from 2.7 to 4.1 (improvement of 1.4 points).
- Comprehension of short texts: from 2.8 to 4.3 (improvement of 1.5 points).
- Ability to infer and critically analyze – from 2.9 to 4.2 (1.3 point improvement).

This increase reflects the impact of the interactive activities implemented in Exelearning, which included digital readings, contextualized vocabulary exercises, and assessments that allowed students to interact with the content in more in-depth ways. The immediate feedback offered by the platform allowed students to correct errors quickly, reinforcing learning and improving their academic performance.

2. Students' Perceptions of Using Exelearning

The perception surveys revealed that students positively valued the use of the Exelearning platform in the English learning process. 92% of students indicated that the platform allowed them to learn more dynamically and better understand English texts. Student feedback reinforces this idea:

"I liked the vocabulary exercises, because I could see how to use the words in different contexts." Exelearning made the readings easier to understand because the activities were interactive."" I felt more motivated to study English because I could do the activities from home."

In addition, 80% of students mentioned that collaborative assignments and online discussions helped them improve their ability to speak English, by allowing them to practice the language in a safe and pressure-free environment. Students also highlighted the immediate feedback on the activities, which allowed them to adjust their understanding in real time and reinforce concepts that they did not initially understand well.

3. Classroom dynamics

The observations made in the classroom during the activities in Exelearning showed a positive change in the class dynamics. Initially, classes were predominantly teacher-centered, with few moments of active interaction among students. However, after the implementation of Exelearning, classes became more participatory and collaborative. Students worked in small groups, participated in interactive tasks and online discussions, which favored a more dynamic and collaborative learning environment.

In the post-intervention phase, students began to interact more with each other, sharing ideas, discussing answers, and helping each other. Group activities promoted cooperation, which increased engagement and accountability in learning. 84% of teachers reported that students were more engaged and proactive in collaborative activities, suggesting that using platforms such as Exelearning fosters positive attitudes towards learning English.

Table 1.

Summary of the Results

Indicator	Pretest Average	Average Post-Est	Increment
Vocabulary	2.7	4.1	+1.4
Comprehension of short texts	2.8	4.3	+1.5
Inference and analysis capabilities	2.9	4.2	+1.3
Student Engagement	60%	92%	+32%
Motivation	70%	94%	+24%

Conclusion of the Results

The results obtained show that the use of Exelearning has had a significant positive impact on the academic performance of students in terms of reading comprehension, as well as on their motivation and participation in class activities. The platform facilitated more dynamic and autonomous learning, providing students with the flexibility to learn at their own pace and immediate feedback to reinforce knowledge.

In addition, classroom dynamics shifted from a traditional teacher-centered model to a more interactive and collaborative approach, allowing students to share ideas and work together on problem-solving. These changes contributed to improving not only reading skills, but also students' interest and motivation in learning English.

Discussion

The results obtained in this study highlight the effectiveness of educational digital platforms, such as Exelearning, in improving reading skills in English, as well as in the motivation and participation of students in the rural context. Next, the main findings of the research and their relationship with the existing literature on the use of educational technologies and the teaching of foreign languages in rural areas are analyzed in depth.

Positive impact of digital tools on academic performance

The significant increase in reading comprehension test scores, especially in key areas such as vocabulary, short text comprehension, and inference skills, confirms what many previous studies have pointed out about the effectiveness of digital tools in foreign language learning. The ability of platforms such as Exelearning to provide interactive and multimedia activities allowed students to improve their understanding of content in a way that was not possible with more traditional teaching methods (Garrison & Kanuka, 2004). By integrating tools such as interactive quizzes, multimedia readings, and hands-on exercises, students were able to apply what they learned in a more dynamic and contextualized way, which favored active and autonomous learning.

This finding is in line with Hattie's (2018) theories on visible learning, which suggests that the use of interactive tools and immediate access to feedback help students better understand concepts and strengthen their learning. In this study, the continuous feedback provided by Exelearning played a crucial role, allowing students to adjust their learning and improve their performance in real-time.

Motivation and Participation: A Shift to Autonomous Learning

Student motivation was another key factor that positively impacted academic performance. About 92% of students indicated that Exelearning made classes more dynamic and motivating, resulting in increased participation in class activities. This increase in motivation aligns with the theory of intrinsic motivation proposed by Deci and Ryan (2002), who argue that students are more motivated when they perceive learning to be relevant and personalized. The activities in Exelearning offered students autonomy in their learning and allowed them to work at their own pace, which favored their interest and engagement.

In particular, collaborative assignments and online discussions encouraged interaction among students, which helped to create a more participatory classroom environment. Collaborative learning has been identified as one of the most effective strategies for improving language skills, especially in a foreign language (Johnson & Johnson, 1999). By working in groups and sharing ideas, students not only reinforced their understanding of the content, but also improved their communication skills in English.

Transforming classroom dynamics

An important aspect observed during the implementation of the intervention was the change in classroom dynamics. Prior to the intervention, English classes were predominantly teacher-centered, with students taking a passive role. However, after the implementation of Exelearning and the use of collaborative activities, the dynamics of the classes were transformed into a more interactive and student-centered modality. Students felt more empowered by having the flexibility to work on activities at their own pace and collaborate with their peers. This shift is consistent with the student-centered approach to learning, which favors active participation and the development of autonomous learning skills (Tomlinson, 2001).

The fact that students became more involved in collaborative activities reflects a greater commitment to their own learning process. In addition, online collaboration through discussions and group projects allowed students to share ideas, discuss concepts, and help each other solve problems. This type of learning, in which students not only acquire knowledge but also develop social and communicative skills, is essential for the mastery of a second language (Vygotsky, 1978).

Implementation challenges and contextual barriers

Despite the positive results, the research also revealed some challenges in the implementation of the Exelearning platform. One of the main obstacles was limited access to technology in some students' homes. Although students had access to mobile devices, the quality of internet connection in some rural areas affected the effectiveness of online activities, suggesting that technological infrastructure remains a significant barrier to a full implementation of ICT in rural education.

In addition, some teachers mentioned that the adoption of new educational technologies was an initial challenge, as it required time to adapt to digital tools and adjust traditional pedagogical strategies. This finding highlights the importance of continuous training of teachers in the use of ICTs to ensure that they can effectively integrate them into their pedagogical practice.

Conclusion of the discussion

In conclusion, the results of this research demonstrate that the use of Exelearning and digital tools in the teaching of English had a significant positive impact on students' reading comprehension and motivation. The digital platform provided a space for autonomous and collaborative learning, which favored the improvement of academic performance and transformed classroom dynamics towards a more participatory model. However, limited technological infrastructure and the need for teacher training in the use of technologies remain barriers that need to be addressed to maximize the impact of ICT in the classroom.

This study underscores the need to strengthen education policies that promote the use of educational technologies in rural areas, ensuring access to appropriate digital resources and providing continuous training for teachers. By doing so, it will be possible to ensure a more equitable and quality education, providing rural students with the same learning opportunities as their urban peers.

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