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**Enhancing Phonological Awareness Skills using Quizlet and BoomCards
webtools to improve students' reading comprehension skills.**

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List of acronyms

RC	:Reading comprehension
PA	:Phonological Awareness
CALL	:Computer Assisted Language Learning
EFL	:English as a Foreign Language
SVR	:Simple View of Reading
VET	:Verbal Efficiency Theory

Abstract

This action research examines the contribution of phonological awareness skills implemented through Quizlet and BoomCards to enhance the reading comprehension of a group of 4th graders. Utilizing a mixed-methods approach, four instruments were employed: pre- and post-intervention reading tests, a Likert scale survey to assess student perceptions, focus group discussions, and audio logs for reflective practice. The findings revealed a significant improvement in reading comprehension, with mean scores increasing from 74% to 86%, alongside a decrease in standard deviation, indicating more consistent performance among students. However, absenteeism affected the learning outcomes of some participants, underscoring the importance of regular engagement in educational activities. Additionally, students reported enhanced motivation and engagement due to the incorporation of audio and visual aids, which facilitated better decoding skills. The analysis of student perceptions indicated an overall positive impact of the digital tools, with an increase in the number of students achieving higher scores by the fifth session in the Likert scale and post intervention test. Nonetheless, individual variability highlighted the necessity for personalized instructional strategies to address diverse needs. The researcher's reflections revealed a shift toward a student-centered instructional approach, driven by the need to adapt teaching strategies in response to challenges encountered during implementation. This collaborative problem-solving experience fostered greater ownership of learning among students and contributed to the researcher's professional development. Overall, while positive outcomes were observed, there is a need for continuous refinement of instructional methods and targeted support for specific phonological skills to further enhance reading proficiency among English as a Foreign Language (EFL) students.

Keywords: Phonological Awareness, Decoding, Reading Comprehension.

Resumen

Esta investigación-acción examina la contribución de las habilidades de conciencia fonológica implementadas a través de las aplicaciones Quizlet y BoomCards para mejorar la comprensión lectora de un grupo de estudiantes de cuarto grado. Utilizando un enfoque de métodos mixtos, se emplearon cuatro instrumentos: pruebas de lectura pre y post-intervención, una encuesta tipo Likert para medir las percepciones de los estudiantes, discusiones en grupos focales y registros de audio para la reflexión del investigador.

Los hallazgos revelaron una mejora significativa en la comprensión lectora, con puntajes medios que aumentaron del 74% al 86%, y una disminución en la desviación estándar, lo que indica un rendimiento más consistente entre los

estudiantes. Sin embargo, el ausentismo afectó los resultados de aprendizaje de algunos participantes, subrayando la importancia del compromiso regular en las actividades educativas. Además, los estudiantes reportaron mayor motivación y compromiso gracias a la incorporación de ayudas audiovisuales que facilitaron mejores habilidades de decodificación.

El análisis de las percepciones estudiantiles indicó un impacto positivo general de las herramientas digitales, con un aumento en el número de estudiantes que lograron puntajes más altos en la quinta sesión. No obstante, la variabilidad individual destacó la necesidad de estrategias instruccionales personalizadas. Las reflexiones del investigador revelaron un cambio hacia un enfoque centrado en el estudiante y la necesidad de adaptar las estrategias de enseñanza ante los desafíos encontrados. En general, aunque se observaron resultados positivos, es necesario refinar los métodos instruccionales y proporcionar apoyo específico para habilidades fonológicas para mejorar aún más la competencia lectora entre los estudiantes que aprenden inglés como lengua extranjera

Palabras claves: Conciencia fonológica, Decodificación, Lectura Comprensiva.

CHAPTER I: Introduction

1.1 Background Information

Reading is the act of processing text to derive meaning. This is considered a crucial skill to develop proficient academic skills and plays a fundamental role in developing high-order psychological processes (Vygotsky, 1979). According to this, a skilled student must master the linguistic aspects of the language and quickly recognize words in a text, extracting phonological awareness (P.A.), semantic, and orthographic knowledge to comprehend the text effectively (Burrows, 2016). By offering appropriate instruction, including the use of technological tools and constant practice, learners can enhance their memory retention and boost their confidence in academic performance in the language (Baker, 2014). From this perspective, teachers should be able to implement and recognize phonological awareness as a crucial skill to enhance reading comprehension in an EFL context. Through appropriate decoding and word recognition skills based on the explicit instruction of P.A. skills, students can enhance their receptive skills and establish a paramount difference towards the low results obtained in a national context. Cárnio (2017, p.599) states that “syllabic and phonemic skills of phonological awareness are key to good performance on text and sentence reading comprehension”.

Proficiency levels in reading comprehension in the Chilean educational context have been a controversial discussion over the last few years among the educational teaching community. Ortega (2019) supports this idea, claiming there is a feasible correlation between the educational level of students and the decrease in their reading skills and concludes that specific factors that influence skill acquisition have been removed over the years. This idea is explained by the reality that students in Chilean schools face when learning English since they only begin their EFL learning process in 5th grade (MINEDUC, 2018), excluding elementary skills that students must acquire in their early literacy stage as they are the development of EFL decoding and phonological awareness skills.

1.2 Problem statement

After considering all the aspects that should be prioritized in the Chilean EFL classroom regarding reading skill development, there is a group of 4th graders at Colegio Bautista de Temuco, that differs from this ideal situation due to various factors that hinder their reading progress. These students often pause while reading to recognize specific words, mainly because they cannot associate print with its corresponding sound, which impedes their overall reading fluency and, consequently, their reading comprehension. This lack of confidence stems from their low awareness of the differences between sounds and printed words, even when they understand the meaning of the words once the teacher articulates them aloud. Additionally, as noted by Burrows (2016), the limited traditional decoding and word-

recognition instructional strategies implemented in the classroom are typically inconsistent and do not provide continuous training in this area.

To solve this challenge, the proposed action research aims at enhancing students' phonological awareness and, consequently, their reading comprehension skills using 'Quizlet' and 'BoomCards' as web tools. These platforms embody the principles of computer-assisted language learning (CALL), as they are engagement, motivation, immediate feedback, and contextual language use (Raman & Mohammed, 2013). By providing innovative word recognition and decoding tasks, these tools help students build confidence in their reading for gist skills and offer autonomous learning pathways (Helwa, 2017). Specifically, Quizlet and Boom Cards offer targeted activities designed to develop phonological awareness skills and decoding abilities, such as print-to-sound recognition and vice versa tasks. These tools are particularly beneficial for students in the pre-reading stage, as they help build confidence before engaging in reading tasks.

1.3 Aim

1.3.1 General Objective

To examine the contribution of phonological awareness skills implemented through Quizlet and BoomCards on enhancing the reading comprehension of a group of 4th graders.

1.3.2 Specific objectives

SO1: To assess students' reading comprehension level of a short passage after using phonological awareness skills implemented through Quizlet and Boom cards webtools.

SO2: To analyze students' perceptions after doing phonological awareness activities on Quizlet and BoomCards to improve their reading comprehension skills.

SO3: To reflect on the process of implementing phonological awareness skills using Quizlet and BoomCards to enhance a group of 4th graders' reading comprehension skills.

Chapter II: Conceptual Framework

2.1 The reading comprehension skill in the Chilean context

The reading comprehension skill in the Chilean educational context faces significant challenges, primarily due to the low percentage of students who achieve acceptable proficiency levels of English as a foreign language once they finish high school. According to the last results of the English SIMCE Test, only 18% of students achieved a level from basic to intermediate regarding receptive skills; productive skills were not assessed (MINEDUC, 2009). This issue reflects educators' urgent need to strengthen the teaching of reading and writing in the Chilean EFL classroom.

According to the guidelines established by the Ministry of Education (MINEDUC), reading literacy encompasses the ability to understand, utilize, assess, and reflect upon texts, as well as to engage with them to achieve self-directed learning outcomes, develop knowledge, and participate actively in society (MINEDUC, 2015). However, the recognition of these essential components in academic texts is not always made explicit throughout the educational process. This oversight is often rooted in the traditional belief that mere exposure to texts will lead to their learning. Moyano (2010) and Carlino (2013) agreed that reading and writing are skills that need systematic instruction, with their effectiveness largely dependent on the educator's experience and engagement within a specific academic community. Furthermore, they emphasize that consistent exposure to written passages and repeated practice of phonemes with similar endings can enhance pronunciation accuracy, particularly for words whose pronunciation diverges from their written form. This approach fosters greater reading fluency and, consequently, improves comprehension of the text's main ideas. As a result, students experience reduced pauses during reading, as their awareness and understanding are heightened through these instructional methods. (MINEDUC, 2015).

This reality suggests the imperative need to implement strategies that boost reading literacy during the early stages, ensuring more integral and effective instruction in Chilean EFL classrooms. EFL teachers must acknowledge the importance of teaching phonological awareness, and the cognitive process involved in reading, adapting their pedagogical practices to promote stronger development of these fundamental and elementary skills essential for students' academic and personal success.

2.2 The reading comprehension process

In recent years, reading comprehension has gained significant importance in the field of L2 acquisition. The choice to become an effective reader and develop appropriate reading skills that enhance fluency and comprehension heavily influences the academic and social students' context (Clements & Tobin, 2021). Reading comprehension is a fundamental skill with a profound and lasting impact on a student's academic development and performance in this field. As students progress academically, they must cultivate proficient reading comprehension skills.

This entails comprehending and engaging with written texts to accomplish personal objectives, expand knowledge, and actively participate in society (OECD, 2015).

Reading is an intricate and multifaceted process involving the dynamic interaction between the text, the reader, and the socio-cultural environment. These elements contribute to the understanding that reading is an integrative process resulting from the interplay of these factors (Ortega, 2019). Establishing an appropriate learning environment is paramount as it provides the framework for fostering a proficient reader. Therefore, a comprehensive approach to reading instruction, one that encompasses the text, the reader, and the contextual influences, is vital for promoting improved reading comprehension skills and overall academic success. From a cognitive perspective, reading is understood as a complex process that operates at various levels. It encompasses fundamental procedures such as grapheme recognition, grapheme-phoneme conversion, and word recognition, which need to be acquired in a suitable and purposefully planned context to ensure that students succeed. This involves intervention strategies such as word recognition, processing individual letters and words, and activating schemata to derive meaning from the context (Brown, 2001).

Reading comprehension and phonological awareness are vital for understanding written information and achieving academic and professional success. These constructs contribute to developing reading and writing skills effectively (Couceiro & Botelho, 2017). Additionally, this process involves assigning syntactic functions to individual words, which contributes to higher-order processes like integrating meaning from sentences to form coherent discourse and making inferences (Van den Broeck et al., 2010). Reading requires both decoding and comprehension, as it is an integrative and constructive activity that emerges from the dynamic interaction between the reader, the text, and the context (Gallego Ortega et al., 2015). This interaction highlights the complexity of reading, emphasizing the necessity of developing cognitive skills and contextual understanding for effective comprehension.

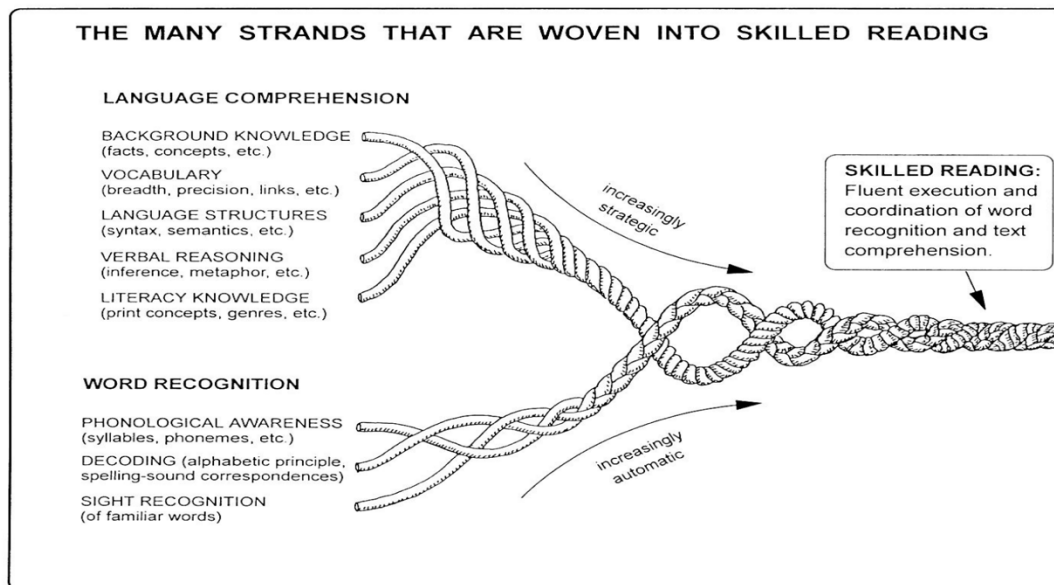
Upon thoroughly considering all aspects of the reading process, the teacher-researcher identified in his educational context a crucial need among his group of students from 4th grade in a primary school from Temuco. The main weakness was observed in the development of their skimming skills, particularly the ability to read for the gist as a subskill. These students struggle with grasping the meaning of words when reading a short passage of text. Their full understanding of these words only comes after the teacher pronounces them and connects the sound with a meaning they already understand. To address this weakness, a focused solution centered on improving their reading skill with the support of phonological awareness strategies, which are likely to offer valuable insights to resolve this issue.

2.3 Simple view of reading theory (SVR)

The simple view of reading postulates that reading comprehension is related to two skill sets: decoding and linguistic comprehension (Gough & Tunmer, 1986). Decoding involves identifying words in print, while linguistic comprehension concerns understanding spoken language. These skills establish the fundamental requirements for acquiring proficient and precise reading abilities. The efficacy of these skills may vary based on the developmental stage at which students initiate their reading skills and their familiarity with the words being read (Nation, 2019).

Figure 1 explains that the complex process of reading comprehension determines how effectively the skilled reader is expected to develop his reading skills. Through this process, it is also concluded that the process of reading presents a sequence of events that might affect the rest as a direct result of one missing step (Davis, 2006).

Figure 1 Scarborough's Reading Rope.



Source: Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97-110). New York: Guilford Press.

The Simple View of Reading (SVR) recognizes the complexity of the reading process, and the various factors involved in acquiring reading skills while also harnessing these complexities within its two primary components (Hoover & Gough, 1990). Consequently, word recognition problems are, according to the researchers, directly associated with decoding skills, which are considered a persistent challenge for students within the context of this research.

To learn how to read, children must master fluent word reading and language comprehension (Gough & Tunmer, 1986). Therefore, it is essential to establish effective reading strategies to enhance learners' reading comprehension skills (Agustin et al., 2023). As stated by Nation (2019, p. 49), 'Early on, reading comprehension is highly constrained by limitations in decoding. As children get older and decoding skills increase, the correlation between linguistic comprehension and reading comprehension strengthens'.

In this regard, a lack of strategies to appropriately develop students' decoding skills in a foreign language context, along with an inexistent implementation of explicit word recognition instruction may result in low reading comprehension test scores and a negative perception of the challenges presented by second language learning to the students. Decoding directly contributes to the ability to identify words (Nation, 2019). Therefore, this study focuses on students' decoding skills and how they can be enhanced by addressing areas for improvement in early EFL literacy acquisition.

2.4 Reading a text for the gist: skimming

Reading comprehension involves diverse processes that students use during the reading experience. To improve reading skills effectively, achieving an appropriate balance between top-down and bottom-up strategies is crucial. The "interactive compensatory model" proposed by Alderson (2000) suggests that educators can address knowledge deficits by integrating these two approaches, ultimately enhancing students' reading comprehension and performance (Rotko, 2023). As mentioned by Rotko (2023, p. 6448), "We should bear in mind that top-down and bottom-up processes are like pieces of the same puzzle."

Two key features of the reading process—skimming and scanning—illustrate this balance. Scrivener (2005) views these sub-skills as a set of strategies, ranging from simple inquiries about a text's main idea to more specific tasks that require students to locate information necessary for real-life applications. By applying these techniques, educators can propose a more interactive and effective reading comprehension process.

As mentioned by Harmer (2005, p. 221), "Sometimes it is the individual details that help us understand the whole; sometimes it is our overview that allows us to process the details." Thus, skimming plays an important role in the following action research. Gist refers to extracting the general idea of a text. Whenever a person reads quickly to grasp the purpose of the text, its genre, the main idea, or the writer's intentions, they are reading for gist. This skill is closely aligned with skimming, as both techniques emphasize obtaining an overview of a text to extract its general ideas (Harmer, 2017). According to Harmer (2017), skimming is a technique used to gain a quick overview of a piece of writing and enables readers to focus effectively on the

main points and supporting details. Reading for gist is particularly crucial when students need to comprehend texts containing substantial new information, as this strategy helps them identify and understand the main ideas efficiently (Octavia & Wilany, 2018).

Providing students with an appropriate set of strategies to develop their reading skills is essential, as it enables them to determine the importance of the texts they encounter and identify the steps they should follow during specific moments of the reading task. A study conducted by Chamot (2005) offers meaningful insights into the confidence students gain when they are explicitly taught strategies to overcome challenges in extracting the main ideas from a text. Additionally, Indah et al. (2023) found that students take less time to locate answers based on hints provided in the text after implementing a treatment focused on skimming strategies. Therefore, Agustin (2023, p. 22) states, "Skimming can aid students in finding the essential words that enable them to deduce the overall meaning of a book, thereby facilitating faster text interpretation and advancing in the reading process." This process must be strongly supported by utilizing resources and strategies that complement the goal of achieving effective reading in the EFL classroom. Ultimately, teaching effective reading strategies is paramount for overcoming challenges and enhancing learners' reading comprehension skills.

2.5 The role of decoding skills and word recognition in the reading comprehension process.

A fundamental aspect of word recognition is the ability to decode words effectively. When students understand that letters represent the sounds we articulate, they demonstrate comprehension of the alphabetic code, commonly referred to as the alphabetic principle (Munger, 2016). To instruct children in accurate word decoding, they need to grasp the alphabetic principle and be familiar with the relationships between letters and their corresponding sounds. This understanding helps students develop fluent reading skills and comprehensive literacy abilities (Nkurunziza, 2024). Decoding skills are essential for learning to read, as they serve as a critical bridge between children's spoken language abilities and their reading proficiency. Research indicates that early mastery of decoding is a strong predictor of future reading comprehension, with children who struggle to decode in the early grades often continuing to face difficulties as they progress through school. Effective decoding contributes to the development of sight word recognition, allowing frequently encountered words to become instantly recognizable, which in turn enhances reading fluency and efficiency. To facilitate decoding skills in children, it is necessary to establish previous conceptions to them, in the first place that print carries a message and second that letters correspond to sound in spoken language (Beck, 2013).

Word recognition skill is a key element in terms of reading comprehension acquisition since this embraces all the elements required in diverse reading tasks students could face, aiming at improving reading comprehension (Gunobgunob-Mirasol, 2019). The semantic knowledge, orthographic knowledge, and phonological awareness; encompass the framework of an integral understanding of words in different aspects as they are reading fluency, understanding, and context by focusing on the aspects related to identifying words (Nation, 2019). Even though extensive research has been conducted on the relationship between phonological awareness and reading comprehension, findings often remain inconclusive, particularly regarding the effectiveness of word recognition strategies. Holsworth (2020), argues that many studies yield neutral results because they fail to consider the multifaceted nature of word recognition skills, which encompass not only the ability to decode words but also the integration of phonological awareness, vocabulary knowledge, and contextual understanding. This oversight suggests a need for a more comprehensive approach to literacy instruction that recognizes the relationship between these components.

Phonological awareness is critical for developing word recognition skills, as it enables learners to decode and manipulate sounds in language. Research indicates that students with strong phonological awareness are better equipped to recognize words quickly and accurately, which enhances their reading fluency and overall comprehension (Couceiro & Botelho, 2017). Conversely, students who struggle with phonological awareness often face significant challenges in word recognition, leading to difficulties in understanding texts. This highlights the importance of targeted interventions that focus on improving phonological awareness to boost word recognition and, ultimately, reading comprehension.

Additionally, different authors have highlighted the importance of efficient word recognition as a prevailing predictor of reading abilities in both L1 and L2 as well (Perfetti et al., 2005). Although there is not sufficient research on what specific methods could support students' improvement of their word recognition skills, the need for future research on the topic relies on the relevance of the results obtained from previous research and consolidated authors in the field (Perfetti, 2005; Burrows, 2016; Holsworth, 2020; Nation, 2019).

Explicit instructional word recognition strategies have demonstrated being pivotal in the positive effects they have upon reading comprehension skill development (Burrows, 2016). In this regard, the implementation of the strategies contributes directly to the efficient development of word recognition proficiency, which also enhances learners to become fluent L2 readers (Perfetti, 1985). Consequently, strategies that involved students' engagement and word recognition are crucial to achieve the requirements in terms of the acquisition of reading comprehension skills.

2.6 Phonological awareness

Phonological awareness (P.A.) is the ability to reflect and manipulate the language sound units (Ehri, 2004). It helps children to understand that sounds represent letters, this is considered a critical aspect of acquiring the alphabetic principle (Anthony & Francis, 2005). It is a crucial predictor of skilled readers in their early reading stages, and it has been proven to be critical for learning to read any alphabetic writing system (Ehri, 2004). Several studies, as in Wagner et al. (2013) have supported the fact that this skill precedes word recognition, enabling the appropriate use of the language in reading and the efficient bond set between P.A. and word-level reading. Moreover, after implementing P.A. instruction in EFL students, further research by Al-Tamimi & Rabab'Ah (2007) concluded that a strong grasp of knowledge of P.A. had significantly influenced the development of word recognition in those students.

Consequently, direct instruction on P.A. is required in the classroom as an explicit method to support and validate students' knowledge in P.A. and as a predictor of appropriate reading skills. Furthermore, this research aligns with the one conducted by Ghorbani (2016), who refers to explicit instruction, as the appropriate method to teach phonological awareness among students, to become more conscious and capable of understanding the importance of good decoding skills.

The present action research study aims to investigate the role of phonological awareness (PA) in supporting students' reading comprehension through the development of effective word recognition skills. The teacher-researcher, guided by empirical evidence from previous studies, decided to focus the intervention on teaching specific PA skills, including phoneme segmentation, blending, syllable awareness, sound matching, and rhyme recognition (Ehri, 2014; Gillon, 2018). These skills were selected based on their frequent inclusion in the literature as key components of PA, and their compatibility with the digital tools that will be implemented during the intervention plan (Henbest & Apel, 2017). The rationale for this targeted focus on PA instruction is grounded in the well-established relationship between PA, word reading, and reading comprehension (Castles & Coltheart, 2004; Hulme et al., 2012). By explicitly teaching these PA skills, the intervention seeks to enhance students' phonological awareness, which is essential for fluent word recognition and, ultimately, reading comprehension (Perfetti, 2007).

Similar to the development of phonological awareness, the comprehension of the alphabetic principle and the acquisition of familiarity with letter-sound correspondences do not occur innately. Some children may independently discover the close relationships between spoken language, listening and written text through exposure to literacy experiences and rich environmental stimuli. Even though a significant number of learners require explicit instruction to attain this fundamental understanding. Research conducted by Boyer & Ehri (2011) suggests that such targeted instructional approaches can lead to substantial improvements in word

recognition abilities. Therefore, it is crucial to provide learners with explicit instruction in the alphabetic principle and letter-sound correspondences to improve the development of word recognition skills, particularly for those who do not acquire these concepts naturally through exposure.

Students who obtain the alphabetic principle and have received instruction in letter-sound correspondences, facilitated by phonological awareness and targeted letter-sound teaching, are well prepared to begin decoding simple words such as "cat" and "big" accurately and independently. This basic and important skill in decoding contributes to high initial accuracy, which is crucial as it enhances the likelihood that children will engage naturally in reading activities. As a result, their word recognition abilities are likely to improve over time. Additionally, providing effective instruction in letter-sound correspondences and teaching students how to apply these correspondences for decoding is essential, as the resulting advancements in word recognition can significantly enhance reading comprehension (Brady, 2011). Thus, a strong focus on letter-sound instruction is vital for fostering students' literacy development.

2.7 CALL methods (to support RC)

Computer-assisted language learning (CALL) has become an increasingly valuable tool in teaching English as a Foreign Language (EFL), particularly in the modifications to teaching patterns that have occurred over the last few decades since its introduction (Benyo, 2020). According to Felix (2008), the vast amount of data available on the internet can produce positive effects on language acquisition, specifically in areas such as reading, writing, and listening. From this perspective, CALL aims to normalize technology in the classroom, leading to its complete integration into diverse aspects of our lives (Bax, 2006)

Normalizing CALL methods in language education is essential for maximizing the benefits they evoke for educators and learners. Additionally, CALL normalization promotes teachers and learners with a clear goal, establishing focused outcomes for research and constant learning. This approach facilitates the integration of CALL into daily teaching practices and supports standardized implementation to enhance the effectiveness of language learning strategies.

By integrating CALL methods into EFL classrooms, educators can foster engaging, interactive, and personalized learning experiences that facilitate the development of language acquisition skills. Additionally, CALL enables teachers and students to receive and provide immediate feedback. According to Devi (2016), this immediate feedback is crucial as it allows the identification of errors and provides instant suggestions for correction, aiding learners in rectifying their mistakes. Immediate feedback also enables students to correct misconceptions and reinforce their understanding of phonological concepts through practice. This dynamic feedback

process enhances understanding and promotes a more effective learning environment.

As mentioned earlier, phonological awareness involves recognizing and manipulating sounds in spoken language, serving as a crucial foundation for reading and spelling. CALL activities can be tailored to help students practice identifying, segmenting, and blending sounds in words. This aligns with the purpose of this research, emphasizing how CALL methods can enhance reading comprehension skills by fostering phonological awareness. As mentioned by Benyo, (2020, p.1390) “CALL puts a strong emphasis on student-centered materials that allow learners to work on their own. Such materials may be structured or unstructured, but they normally consist of two important features – interactive learning and individualized learning.” CALL enables teachers to enhance the language learning process effectively. This method reinforces content taught in the classroom and is an effective tool for students who need additional support. Moreover, it emphasizes the importance of creating an appropriate learning environment and providing the necessary tools for students to engage in group activities. This ensures learners’ ability to absorb information and progress at their own pace (Đorđević, 2016).

In conclusion, one key advantage of CALL methods is their ability to present material in a stimulating manner that fosters student involvement in the learning process. This active participation allows learners to construct their knowledge more effectively. Consequently, CALL methods contribute to a flexible, dynamic approach to teaching phonological awareness skills, ultimately enhancing reading comprehension (Đorđević, 2016).

2.8 “Quizlet” and “Boomcards”: Web tools towards an inclusive approach to teach phonological awareness skills.

According to Raman & Mohammed (2017), the integration of technology is a must since it is highly beneficial to all language learners. Nowadays, students recognize the importance of learning through technology and the positive perceptions towards the use of this in the classroom (Dizon, 2016). Through the use of technology, students have the opportunity to use instructional strategies and play word games, word sorting, making cross-linguistics connections and increase their exposure to the language (Miller, 2016).

Quizlet is a helpful and diverse tool which could be used in the classroom and independently by the learners. It supports teachers’ teaching of literacy skills, specifically in terms of vocabulary and word recognition. It also provides opportunities for students to enrich vocabulary and take advantage of technology and all the functions included to practice and assess their own learning (Pham,

2022). According to Perfetti, (1985) in his Verbal Efficiency Theory (VET), automatized and efficient word recognition are core criteria for proficient reading comprehension. This aligns directly with the features of the webtool, and the results provided by different research that showed the positive impact that computer assisted language learning (CALL) has in the improvement of English vocabulary (Helwa, 2017).

Burrows & Holsworth (2016) analyzes various studies and identifies a significant lack of effective strategies for teaching word recognition skills among students. The author argues that the challenges associated with developing efficient word recognition instruction primarily stem from the absence of one or more of the three essential components: semantic awareness, lexical awareness, and phonological awareness, with the latter being considered crucial for effective instruction. To address this issue, Quizlet and boom webtool, offers a practical solution by allowing teachers to create lists of words, flashcards, and, if necessary, audio pronunciations. This digital tools not only complements traditional teacher instruction but also enhances students' word recognition skills (Jitendra et al., 2007).

Boom cards emerged as a valuable web tool designed to enhance phonological awareness skills and promote interactive technology use in the classroom through different areas. By promoting active student participation, Boom facilitates explicit learning strategies considered essential to achieve an effective learning process (Chamot, 2005). The platform Boom Cards have significant implications for teaching phonological awareness, as research indicates that interactive digital resources like these significantly boost student engagement and motivation, the two considered critical factors in developing phonological skills (Wolak, 2023). In addition, Boom Cards platform aligns with the principle of immediate feedback established by CALL methods, allowing students to correct misconceptions and strengthen their understanding through practice. By reinforcing the principles of repetition and active engagement, Boom Learning effectively supports students in mastering essential phonological skills. The aforementioned web tools were implemented and tailored to meet the specific needs of 4th-grade (EFL) students in a private school, aiming towards an improvement in their phonological awareness skills to enhance their reading skills in English as a foreign language.

Chapter III: Methodology

3.1 Type of study

This study corresponds to action research because it is focused on a problematic situation that needs to be addressed in a Chilean EFL classroom, and it proposes a solution to the classroom issue detected. In this case, there is a group of 4th grade students from a school who presented problems with their reading skills because of the limited phonological awareness they exhibited when decoding words in a written text. In this regard, action research (AR) could be considered a tool used by teacher researchers to solve problematic situations in their context (Ravid, 2015). Furthermore, action research observes and analyses the process carried out in a classroom to produce a change and the support this action finds in the academic findings (Burns, 2008).

As mentioned by Burns, (2022) action research involves a planned intervention that deliberately puts into place particular strategies, processes, or activities in the research context. In this case, the teacher researcher implemented strategies to teach phonological awareness skills (segmentation, rhyme recognition, blending, segmentation, and sound matching) to a group of 4th graders by using two technological tools known as Quizlet and Boom cards to enhance their reading comprehension skills.

3.2 Description of participants

The action research was conducted in a private school in Temuco, with a sample of 14 students from 4th grade, made up of 9 females and five males aged between 9 and 10 years old, with a low level of English according to the marks obtained in 3rd grade (5.0 or less, where 7.0 is considered the highest mark in the Chilean educational system), and the results obtained from the diagnostic test applied at the beginning of the academic year, which includes reading and vocabulary as the key factors to be analyzed in this research. These students have 4 hours of English lessons a week, and most of them participate in extracurricular activities related to English to improve their marks and skills.

Regarding the sample selection, this action research used a purposive sample. This type of sampling is generally associated to qualitative research and allows the researcher to select specific criteria among the participants that turns into a more meaningful data collection, being this information directly aligned to the action research objectives proposed by the researcher (Palys, 2008). A purposive sampling aligns with the characteristics of the research in terms of the limited resources, time, and workforce (Etikan & Iker, 2016). According to Patton (2002), it is also “useful to identify and select the information-rich cases for the most proper utilization of available resources”.

3.3 RESEARCH QUESTIONS AND OBJECTIVES

3.3.1 Research question

To what extent do strategies for teaching phonological awareness—implemented through Quizlet and Boom cards enhance the reading comprehension skills in a group of 4th graders?

3.3.2 Research General Objective

To examine the contribution of phonological awareness skills implemented through Quizlet and Boom cards on enhancing the reading comprehension of a group of 4th graders.

3.3.3 Research Specific Objectives:

SO1: To assess students' reading comprehension level of a short passage after using phonological awareness skills implemented through Quizlet and BoomCards webtools.

SO2: To analyze students' perceptions after doing phonological awareness activities on Quizlet and Boomcards to improve their reading comprehension skills.

SO3: To reflect on the process of implementing Phonological awareness skills using Quizlet and BoomCards webtools to improve a group of 4th graders' reading comprehension skills.

3.4 Research Problem

In the field of English as a Foreign Language (EFL), reading is a crucial skill for academic success. Neumann (2014) emphasizes its role in ensuring lifelong achievements. According to the Simple View of Reading theory (SVR) Efficient reading involves quick word recognition and thorough language understanding (Gough & Tunmer, 1986), being essential for EFL learners to comprehend the meaning of texts.

The importance of elementary reading skills for academic success emphasizes the need for fluent word reading and language comprehension (Hoover & Gough, 1990). This is established by the Ministry of Education in Chile (MINEDUC) in its proposal for 4th grade students regarding the learning of English, when it mentions the

importance of the appropriate development of communicative skills as it allows students to grow in the intellectual field, opening the possibility to learn from different cultures, ways of thinking and traditions (MINEDUC, 2018). Moreover, the document establishes in terms of reading - as one of the initial challenges students must face the identification of isolated words, among others. Other subskills are related to the use of phonological awareness skills to gain meaning and understanding of what is being said and how this is produced in the language.

However, this ideal situation is far from being achieved with a group of 4th-grade students from a private school in Temuco. In the Chilean classroom, students encounter difficulties in word recognition, specifically in phonological awareness, being this one of the crucial skills to develop their reading fluency and comprehension and their confidence when reading.

To tackle this issue, the following action research focused on teaching phonological awareness skills to 4th grade students through Quizlet and Boom cards webtools to help them enhance their reading comprehension skills. Through Computer-Assisted Language Learning (CALL) principles the researcher proposes a new strategy to boost engagement, motivation, and contextual language use in students' reading comprehension skill (Raman & Mohammed, 2013). By leveraging Quizlet's features, such as engagement and contextual language use, students are expected to improve their word recognition and phonological awareness skills and their academic performance after the intervention plan. Computer assisted language learning methods (CALL) have proved to be more efficient in addressing these issues, since they adapt to the needs of the students in the classroom in terms of engagement as well as efficiency.

This intervention also aims to serve as a pharos to predict factors that might increase students' confidence in reading comprehension and raise their levels of academic performance towards the reading skill in a foreign language.

3.5 Stages of action research

There were 7 stages considered for the following action plan implementation, which were the following: Piloting, pre intervention test, intervention sessions, post intervention test, Likert scale application, focus group and audio logs reflection. The following Table N°1 describes the sessions in detail.

Table 1 Stages of Action Research

Session	Learning Objective	Activities	Data collection instrument	Assessment
Piloting	To present the test to a different group of students from the chosen sample to fix potential errors and improve the instrument before its application to the target group.	The teacher conducted a pilot session and gave the pretest to a different group of students to analyze the pros and cons the test might present before starting with the implementation. Adaptations were made to improve the test.	Written test	Pre-intervention test.
Pre-intervention test.	To establish a baseline regarding students' knowledge of P.A. skills through the implementation of a pre intervention test.	-Students will be introduced to the action research process. The teacher presents the purpose of the research, objectives, and the apps to be used during the intervention. -Students complete a pre intervention reading test.	Written test	Pre-intervention test.
1.	Students will be able to recognize a set of key words sounds from a text by using "rhyme recognition" subskills to improve reading comprehension skills.	-The teacher will present the objectives of the research and introduce the Quizlet and BoomCards webtools, which will be used during the interventions. -Students will learn about the "Rhyme recognition skill" by observing familiar words. The teacher will provide examples using the app, ensuring all students are familiar with these words to facilitate effective learning. -The teacher will present key words that students will read in a short passage. These words will be practiced using the rhyme recognition skill and flashcards in the app, which can be switched to show images representing their meanings. -Students will engage with an interactive function of the app for practice. For assessment, they will read a short passage silently and answer two true/false comprehension questions. After the intervention, a Likert scale will be administered to gather feedback.	Likert scale application	Formative assessment Worksheet with a reading of a short passage. Likert scale to analyze perceptions regarding "rhyme recognition" skill.
2.	Students will be able to identify a set of key words sounds from a text by using "Blending" subskills to improve reading comprehension skills.	-Students will learn the blending skill by recognizing the word "hello," followed by the word "apple" to avoid thematic associations. These exercises will introduce the concept of segmentation. -The teacher will present three additional examples using Quizlet. Flashcards will display different letters and sounds of a word, allowing students to listen, recognize	Likert scale application	

		<p>the full word, and practice pronunciation. Pictures representing each word's meaning will be shown after presenting the sounds. Selected words will increase in complexity, such as "back" and "pack" (backpack) or "air" and "plane" (airplane).</p> <p>-The same procedure will apply to words related to a short passage students will read.</p> <p>-Students will engage with another Quizlet function to test their knowledge (Assessment 1). For Assessment 2, they will read a short passage silently and answer two true/false comprehension questions.</p>		
3.	<p>Students will be able to examine a set of key words' syllable composition from a text by using "Segmentation" subskills to improve reading comprehension skills.</p>	<p>The teacher will introduce students to the skill of "Segmentation" in phonics by explaining it as breaking words into parts. Using a picture of an elephant, the teacher will demonstrate how to divide it according to syllables, followed by similar activities for the words "giraffe" and "potato."</p> <p>Students will then use Quizlet to explore additional examples, where flashcards will split words into letters and sounds, allowing them to practice pronunciation. They will also assist in presenting key vocabulary using the app.</p> <p>Students will practice reinforcing the skill by using BoomCards webtool.</p> <p>After practicing the words, students will read a short passage to assess their comprehension and fluency. Finally, they will complete a Likert scale survey to provide feedback on their experience using Quizlet and BoomCards for learning segmentation</p>	Likert scale application	
4.	<p>Students will be able to elicit key words from a text by using "Syllable Awareness" subskills to improve reading comprehension skills.</p>	<p>-The teacher will greet students and demonstrate clapping for each syllable in "I am very happy today." After providing two more examples, he will explain that this activity illustrates "syllable awareness."</p> <p>-Using Quizlet, the teacher will present examples and encourage students to clap for the number of syllables in short words, gradually progressing to longer ones.</p> <p>- Following the same procedure, the teacher will introduce words that appear in a text the students will read later.</p> <p>-Students will read a short text to assess their comprehension and fluency independently.</p>	Likert scale application	

		-After reading and answering questions, students will complete a Likert scale to provide feedback on their experience using Quizlet for learning "syllable awareness."		
5.	Students will be able to discriminate key words from a text by using "Sound Matching" subskills to improve reading comprehension skills.	Students will learn about "sound syllable" by guessing which of four known words is different. The teacher will reveal that one card has a different initial sound. After repeating the exercise twice, the teacher will explain the subskill "sound matching." -Using Quizlet, the teacher will present similar examples, allowing interaction to identify the odd word based on its initial sound. -The teacher will introduce words related to an upcoming text using the same procedure as before. -Students will use the app to confirm their understanding by selecting correct answers. Those not at the board will engage through Total Physical Response (TPR) to answer. -Students will read a short text to assess their comprehension and fluency independently. -After reading and answering questions, students will complete a Likert scale to provide feedback on their experience using Quizlet for learning "sound matching."	Likert scale application	
		The teacher will inform the students that the sessions focused on the use of web tools to learn (P.A.) skills have concluded. -He will explain that they will now take a test to assess whether they have improved their skills in comparison to the pretest results. -Students will complete the test and submit it to the teacher.	Written test	
Focus group	Students will participate in the focus group interview to gather information regarding their perceptions.	The teacher will explain to the participants that They will go in groups to another room and will answer the questions in order to gather data regarding the perceptions of students about the use of CALL methods to learn P.A. skills	Focus group interview recording.	

Source: Self-elaboration

3.6 Data collection techniques

To address appropriately all the research objectives included in this action research, four instruments were chosen to gather information, which were the following: a pre and post intervention reading test to assess students' performance regarding the use of phonological awareness skills, a Likert scale to measure student's perceptions according to the use of Quizlet and Boomcards, their learning of phonological awareness and their confidence at the moment of facing the process of reading, a focus group whose purpose was to analyze students' perceptions after doing phonological awareness activities on both apps and audio logs which were mainly focused on the process of reflection from the teacher-researcher towards the implementation and the overall view of the whole process. The instruments were validated by students from the master's program and a colleague from the same educational context where the teacher researcher works.

3.6.1 Pre and post intervention test (Appendix A)

- A pre-intervention reading test was conducted before the intervention plan to establish a baseline and gather information about students' performance before the intervention started. On the other hand, the post-intervention reading test presented the results obtained after implementing the intervention plan. Pre and post reading tests were considered an important and popular method to gather information about the results obtained from an intervention process and its effectiveness, (Min Cheng, 2015).

The test chosen to assess students' phonological awareness skills was adapted from the Two Peas in a Pod Assessment Test (Appendix A). This test is a modification of the original phonological awareness test created by experts to evaluate phonological awareness skills in kindergarten and first grade in certain schools across the United States. It measures the skill levels demonstrated by students during the early stages of learning their native language: rhyme recognition, segmentation, blending, syllable awareness, and sound matching. Additionally, it includes a reading comprehension item to gauge students' understanding of a short passage from an adapted text, tailored to their English proficiency levels as outlined by the Plans and Programs for 4th grade defined by the Ministry of Education.

Table N°2 presents the dimensions included in the pre- and post-intervention tests to be assessed. These dimensions are categorized by the number of skills to be implemented during the action plan, along with the reading comprehension skill, which is the primary focus for evaluating improvement following the implementation. Each dimension comprises three items, with each item worth one point, resulting in a total possible score of 18 points.

Table 2 Pre and Post intervention test dimensions.

3.6.1.	Pre and Post intervention test
S.O.1	To assess student's level of reading comprehension of a short passage after using phonological awareness skills implemented through Quizlet and BoomCards
Dimension 1: 3 Items	Rhyme Recognition: This dimension measures students' ability to recognize ending sounds in a word with similar ending or that rhyme.
Dimension 2: 3 Items	Segmentation. This dimension measures students' ability to split spoken words into particular sounds or phonemes
Dimension 3: 3 Items	Blending. This dimension measures students' ability to combine particular sounds into a whole word.
Dimension 4: 3 Items	Syllable Awareness. This dimension measures students' ability to manipulate and / or recognise syllable sounds
Dimension 5: 3 Items	Sound Matching. This dimension measures students' ability to match and pair similar sounds in spoken or written words
Dimension 6: 3 Items	Reading Comprehension. This dimension measures students' reading comprehension of a short passage.

Source: Self-elaboration.

3.6.2 Likert scale (Appendix B)

A Likert scale is a quantitative research technique designed to obtain data that represents participants' attitudes and changes in it along the study (Cresswell, 2018). The Likert scale designed for this study aligns with the Specific Objective N° 2 focused on analyzing student's perceptions towards the use of Quizlet and BoomCards tool and it measures three different dimensions: engagement and motivation (3 items), overall use of Quizlet and BoomCards tool in enhancing Phonological awareness. (3 items), and the perceived impact on students' learning after the implementation of the app to learn phonological awareness skills (3 items). Table N° 2 shows the details:

Table 3 Likert Scale Dimensions

3.6.2 Instrument	Likert scale
S.O. 1	• To analyze students' perceptions after doing phonological awareness activities on Quizlet and BoomCards to improve their reading comprehension skills.
Dimension 1: 3 items	Engagement and Motivation This dimension measures students' perception regarding to the motivation perceived by them in the use of Quizlet tool as a P.A. training tool.
Dimension 2: 2 items	Overall use of Quizlet tool in enhancing P.A. This dimension measures students' perception regarding the effectiveness of Quizlet tool as a tool to enhance P.A. skills.
Dimension 3: 3 items	Perceived impact on learning This dimension measures students' perceptions on the impact that Quizlet tool yields in their own learning.

Source: Self – elaboration

3.6.3 Focus group (Appendix C)

Focus group is a qualitative research technique that allows the researcher to gather data related to participants' opinions regarding a specific experience. It allows the researcher to produce a significant amount of information in a relatively brief period with low financial resources (Mansilla & Huaiquián, 2020). To achieve the Specific Objective N° 1 related to analyzing students' perceptions towards the effectiveness of using Quizlet and BoomCards as tools to enhance phonological awareness skills, a focus group was used with questions categorized in three dimensions; engagement and motivation (2 items), overall use of Quizlet and Boomcard tools in enhancing-phonological awareness.

Table 4 Focus Group Dimensions.

3.6.3 Instrument	Focus group
S.O. 2	-To analyze students' perceptions after doing phonological awareness activities on Quizlet and BoomCards app to improve their reading comprehension skills.
Dimension 1: 2 items	Engagement and Motivation This dimension measures student's perceptions regarding to the use of the webtools to motivate and engage students in their learning process in accordance with the contents they were taught during the intervention.
Dimension 2: 2 items	Overall use of Quizlet tool in enhancing P.A. This dimension considers aspects related to student's perception on the use of Quizlet and BoomCards as an effective tool to teach Phonological awareness and improvement of reading fluency.
Dimension 3: 3 items	Perceived impact on learning This dimension analyzes students' perceptions in terms of the impact that the tools might have to teach any specific topic.

Source: Self – elaboration

In accordance with the sample, 15 students were asked to be part of this process. Letters of consent were sent to parents, requiring permission to record their voices and to allow students to be part of the interview. 14 consent letters from parents confirmed their participation in it.

3.6.4 Audio logs (Appendix D)

An audio log served as a qualitative research tool, enabling the researcher to reflect on the procedures and implementation of specific methodologies or strategies throughout the intervention process. This method provided the educator with parameters to assess improvements across sessions and objectives to be achieved. In the context of this study, the educator employed the audio log to collect data from observations made during the teaching of phonological awareness to students following each session.

Table 5 Audio logs Dimensions.

3.6.4 Instrument	Audio logs <u>(reflect about the process of conducting this research)</u>
S.O. 3	-To reflect on the process of implementing Phonological awareness skills using Quizlet and BoomCards tools to improve a group of 4th graders' reading comprehension skills.
Dimension 1: 1 item	Implication of using CALL methods. This dimension measures the perceptions of the researcher about the implications of using a technological method to teach P.A. to the students as well as the impact it may cause in their process of improving their reading skills.
Dimension 2: 1 item	Own professional development. This dimension focuses in the teacher researcher and the perceptions he had about the process of innovating in the classroom through a methodology based in the use of technology to teach a topic which tends to be taught by using traditional methods like flashcards exposition, direct method among others.

Source: Self – elaboration

Table N° 5 provides a comprehensive overview of the instrument and its distribution throughout the implementation process. Audio logs encompass two dimensions for reflection: the Implication of Using Computer-Assisted Language Learning (CALL) Methods and Own Professional Development. These dimensions serve as a framework for analyzing each lesson within the intervention plan and needs in-depth analysis by the researcher to extract valuable insights regarding the effectiveness of the treatment and to explore the researcher's pre-existing conceptions about implementing innovative processes in the classroom.

Additionally, audio logs serve as a critical tool in educational research and practice, grounded in a social constructionist perspective. It facilitates critical reflection on experiences, perceptions, thoughts, and emotions, supported by a research or educational facilitator (Hargreaves, 2016). These components jointly enhance the understanding of the instructional process while also fostering the professional development of the researcher.

3.7 Data analysis techniques

In the current action research, both qualitative and quantitative data analysis techniques were employed to effectively address the research objectives. To analyze the results obtained from the pre- and post-intervention tests, descriptive statistics were applied; specifically, measures of central tendency—such as mode,

mean, and median—were utilized to present a comprehensive description of learners' performance.

Additionally, the Likert scale data were analyzed with a focus on the mean and mode, treating it as ordinal-level data. A thematic analysis was also conducted to identify the primary topics and subthemes derived from focus group responses regarding students' perceptions of using web tools to learn phonological awareness skills.

Finally, thematic analysis was applied by using MAXQDA24 software, which implemented a word cloud analysis technique to gather insights from audio logs and reflect on the researcher's experiences during the action research implementation process.

CHAPTER IV: Findings

The following chapter analyzes the data collected during the intervention according to the specific objectives established for this study.

4.1 Specific Objective N°1:

To assess students' reading comprehension level of a short passage after using phonological awareness skills implemented through Quizlet and BoomCards web tools.

To gather data related to this objective, a pre and post-intervention reading test was adapted from the "two peas in a pod" group (<https://www.teacherspayteachers.com/store/hello-two-peas-in-a-pod>), which is a test based on the assessment of phonological awareness skills (PA). It is used with students from pre-kinder to 1st grade who use English as their mother tongue. The original test measures 17 different skills of which five were selected for the adapted pre and post-test based on the skills students already had exhibited in their own reading learning process. These five skills were: rhyme recognition, segmentation, blending, syllable awareness, and sound matching. Additionally, a short reading passage was added to the pre and post-test to assess students' performance before the intervention and after it. These five skills turned into 5 different items in the pre and post-test with three exercises each, to assess students' knowledge and it also included a final reading comprehension passage focused on finding general ideas in the text to assess the students' reading for gist. The total test score of this pre and post-test was 18 points to get a 100 % of achievement.

Table N°6 shows the results achieved by students in the pre, and post intervention and sets a comparison between the data gathered before the implementation of the activities related to phonological awareness skills aimed at improving their reading comprehension.

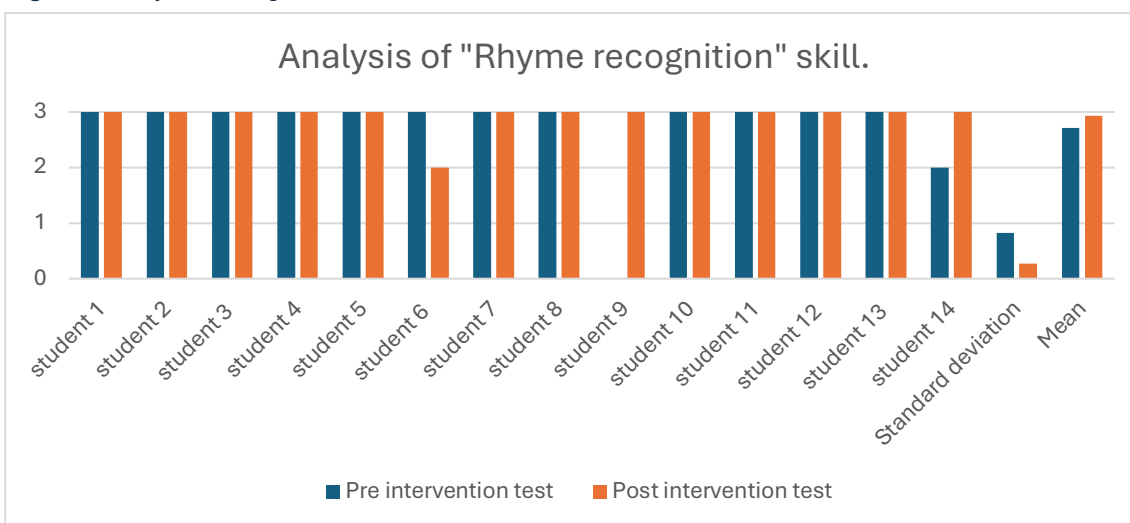
Table 6 Students' Results obtained per skill.

STUDENT	Rhyme Recognition		Segmentation		Blending		Syllable Awareness		Sound Matching		Reading Comprehension		Overall Results	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Student 1	3	3	2	3	1	2	3	0	2	0	2	3	13	11
Student 2	3	3	2	3	2	3	3	3	3	3	3	3	16	18
Student 3	3	3	1	3	1	3	3	3	3	2	3	3	14	17
Student 4	3	3	3	3	2	2	3	3	3	3	3	3	17	17
Student 5	3	3	2	2	1	2	3	3	2	2	3	3	14	15
Student 6	3	2	3	3	2	0	3	3	2	3	1	1	14	12
Student 7	3	3	3	3	1	1	3	3	2	3	1	1	13	14
Student 8	3	3	2	3	1	3	3	2	0	2	3	3	12	16
Student 9	0	3	2	3	0	2	2	3	0	3	3	2	7	16
Student 10	3	3	1	3	3	3	3	3	3	3	1	1	14	16
Student 11	3	3	3	3	2	3	0	1	3	3	1	1	12	14
Student 12	3	3	3	3	1	3	3	3	3	3	1	3	14	18
Student 13	3	3	3	2	2	3	2	3	3	3	1	2	14	16
Student 14	2	3	2	3	1	3	3	2	3	3	2	2	14	16
AVERAGE	2,71	2,93	2,29	2,86	1,43	2,36	2,64	2,50	2,29	2,57	2,0	2,21	13,4 3	15,43

Source: Self-elaboration

4.1.1.1 Skill 1- Phonological awareness: Rhyme recognition results analysis

Figure N°2 presents the results obtained by students in both pre- and post-intervention test in the item regarding **rhyme recognition skill**.

Figure 2 Analysis of "Segmentation" skill.

Source: Self elaboration.

The skill presented a 100 % achievement among 11 students in both pre-and post-intervention tests, representing 79 % of the sample. This group of students achieved a score of 3 on both tests. Only one student (7%) presented a decrease in this item. Finally, it is observed that there was a significative degree of improvement, specifically in the case of student nine, whose result in the item denotes a 100 % of improvement from 0 to 3 points out of 3.

Table N°7 displays a detailed analysis of the measures of central tendency regarding Rhyme Recognition skill.

Table 7 Measures of central tendency “Rhyme Recognition Skill”

Rhyme recognition skill			
Descriptives			
	A	Pre intervention test	Post intervention test
N	14	14	14
Mean		2.71	2.93
Standard deviation		0.825	0.267
Minimum		0	2
Maximum		3	3

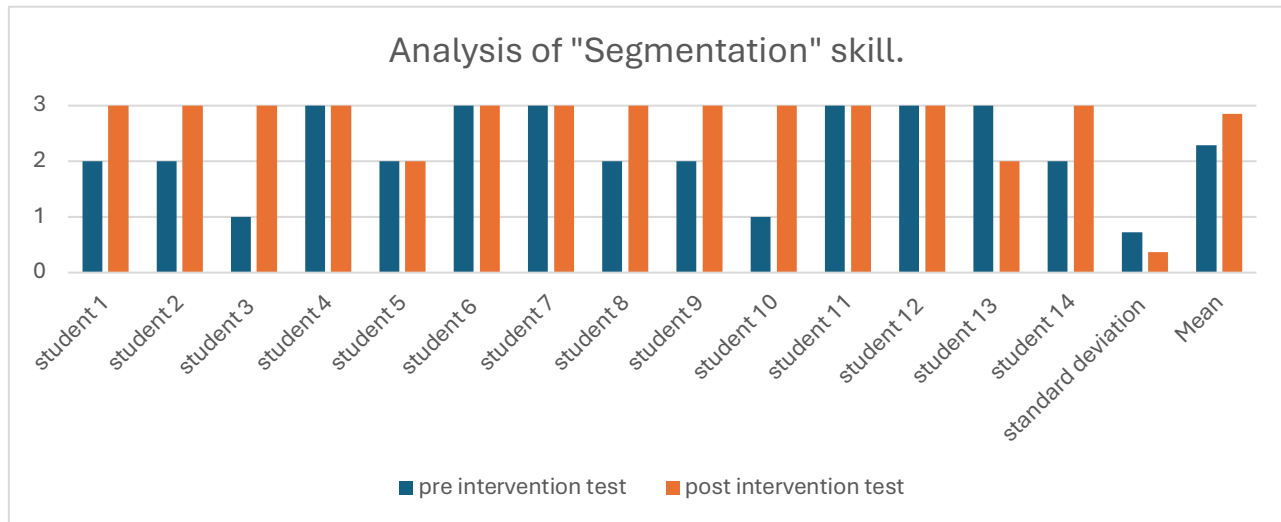
Source: Self elaboration.

The table above illustrates the improvement in students' results, evidenced by a standard deviation value closer to zero in the post-test compared to the pre-intervention test. Notably, the minimum score reflects a substantial increase of 2 points relative to the pre-intervention assessment. Additionally, there is a noticeable rise in the mean score, which increased from 2.71 to 2.93, representing a difference of 0.22 points between the initial assessment and the final evaluation

4.1.1.2 Skill 2- Phonological awareness skill 2: Segmentation results analysis

Figure N° 3 represents students' level of achievement in the segmentation skill, which was the second item of the pre and post-intervention test. The results showed a higher number of students who improved their scores after the implementation.

Figure 3 Analysis of "Segmentation" skill.



Source: Self elaboration.

The analysis of the pre- and post-test results reveals varying degrees of improvement among the students. Out of the total sample, 7 students, representing 50% of the group, demonstrated an improvement in their scores from the pre-test to the post-test. Conversely, 6 students, accounting for 43% of the sample, maintained consistent scores between the pre-test and post-test. Additionally, one student (7% of the sample) experienced a decrease in performance, with scores dropping from 3 to 2 points in this skill area. Among those who showed improvement, most students increased their scores by 1 point (from 2 to 3 points). However, students 3 and 10 exhibited a more significant improvement, each increasing their scores by 2 points (from 1 to 3 points) in the second assessment instance.

Table 8 Measures of central tendency "Segmentation skill".

Segmentation skill			
Descriptives			
	A	Pre intervention test	Post intervention test
N	14	14	14
Mean		2.29	2.86
Standard deviation		0.726	0.363
Minimum		1	2
Maximum		3	3

Source: Self elaboration.

Table N°8 displays the results in terms of measures of central tendency and the minimum and maximum values obtained by students. There was a notorious increase in the mean, comparing both tests.

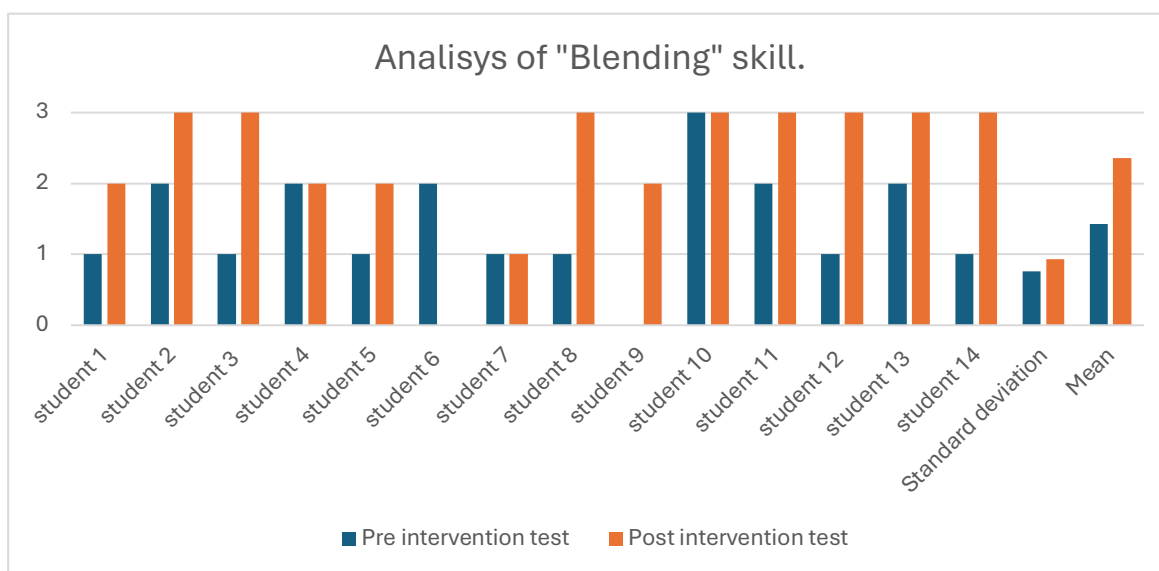
The standard deviation in the post test (0.363), which had a value closer to 0, revealed a more consistent level of answers among students compared to the pre-intervention test (0.726). Additionally, the minimum score (2.0) in the post-intervention test exhibited one point of increase compared to their results in the pre-intervention test, which confirmed students' improvement in the skill when contrasting both tests.

4.1.1.3 Skill 3- Phonological Awareness: Blending Results Analysis

The results obtained in both tests in the skill of blending indicate, as observed in Figure N°4, varied responses among the participants. Only 1 student) obtained 100 % of achievement in both the pre and the post-intervention test.

The results obtained from both tests assessing the skill of blending indicate, as illustrated in Figure 4, varied responses among the participants. From this it is observed that only one student achieved a score of 100% in both the pre- and post-intervention tests.

Figure 4 Analysis of "Blending skill".



Source: Self elaboration.

Additionally, it was observed that 9 students (64% of the sample) demonstrated improvement during the last assessment. Among these, 5 participants showed an increase of 1 point, while the remaining 4 participants exhibited an improvement of 2 points compared to their pre-test results.

Notably, student No. 6 presented a divergent outcome, showing a decrease of 2 points between the two tests (2 to 0 points of achievement in the skill). This result contrasts sharply with student No. 9, who improved from a score of 0 to 2 points in the final assessment. Although the results for this skill are diverse, they collectively confirm an overall improvement in blending skills, as presented in Table 1.

Table 9 presents the results based on measures of central tendency, highlighting an increase in the mean score of nearly 1 point compared to the pre-intervention test. This indicates that the mean score (0.93) reflects a higher number of students providing correct responses following the implementation of the intervention.

Table 9 Measures of central tendency "Blending skill".

Blending skill			
Descriptives			
	A	Pre intervention test	Post intervention test
N	14	14	14
Mean		1.43	2.36
Standard deviation		0.756	0.929
Minimum		0	0
Maximum		3	3

Source: Self elaboration.

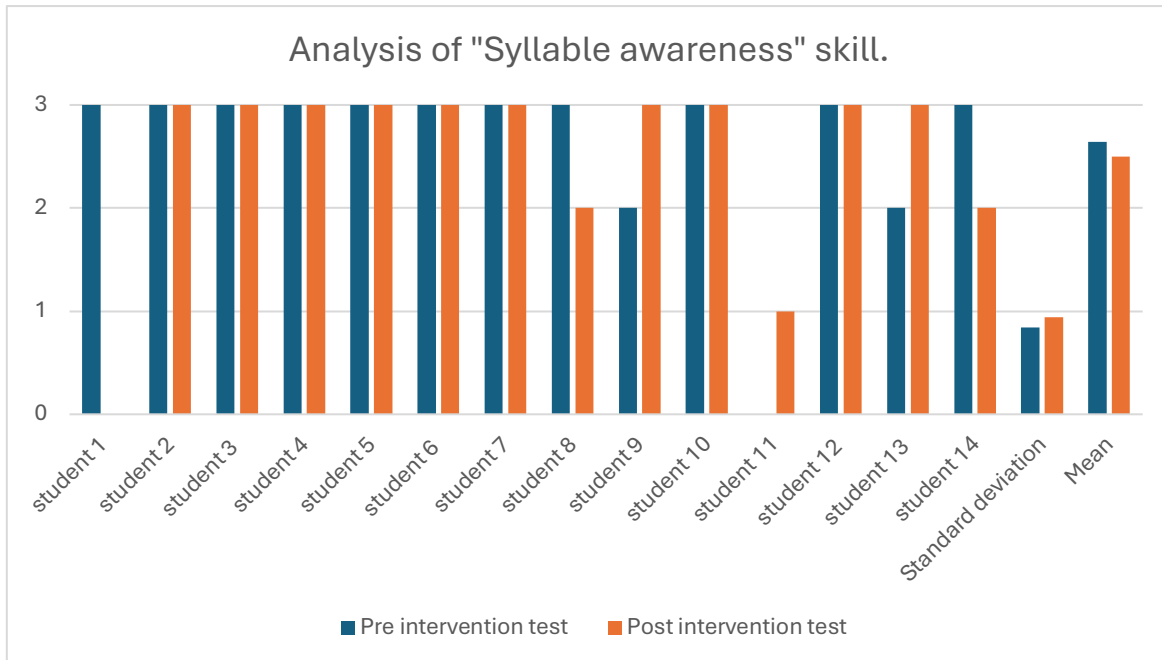
In terms of standard deviation results, the responses indicate a more diverse range of answers, reflecting an increase of 0.173 points when comparing the pre- and post-intervention tests. As shown in Table 3, both the minimum and maximum scores remain unchanged at 0 points and 3 points, respectively, indicating no significant differences in these results

4.1.1.4 Skill 4- Phonological awareness: Syllable awareness results analysis

Figure N° 5 provides information regarding the use of the syllable awareness skill before and after the treatment. Data gathered presents a high level of achievement in students' results, being a total of 8 students (57%) the ones who obtained 100 % of achievement in the skill during both pre and post-test stages. There is the case of

student N° 1 whose results were drastically different from one test to the other as it was observed, whose results represented a decrease of 3 points in comparison to the pre-test results.

Figure 5 Analysis of "Syllable awareness" skill.



Source: Self elaboration.

The results obtained by students in the syllable awareness skill demonstrated a wider dispersion of responses, as indicated by the changes in standard deviation. This variability is exemplified by students No. 8 and 9, whose scores differed by only one point between the two tests; however, the differences increased and then decreased, respectively, across both assessments.

Additionally, participant No. 11 showed an improvement of 1 point, progressing from an initial score of 0 to a final score of 1. This further illustrates the significant dispersion in both the previously mentioned mean and standard deviation values.

Table N°10 presents measures of central tendency regarding Syllable Awareness skill implemented during the intervention.

Table 10 Measures of central tendency "Syllable awareness" skill.

Syllable awareness skill			
Descriptives			
	A	Pre intervention test	Post intervention test
N	14	14	14
Mean		2.64	2.50
Standard deviation		0.842	0.941
Minimum		0	0
Maximum		3	3

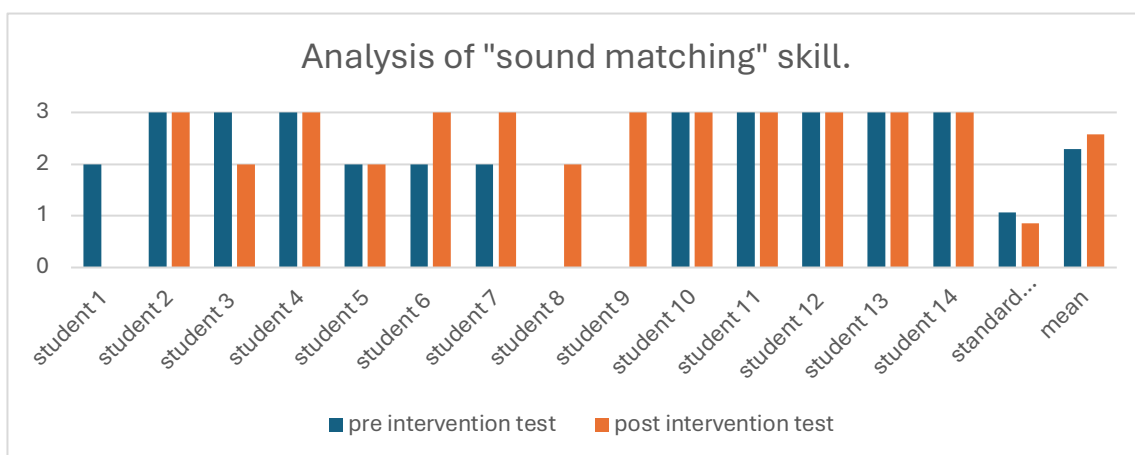
Source: Self-elaboration.

As shown in Table N°10 there is a noticeable change in the results obtained by the students mentioned above when analyzing the increase in standard deviation and the decrease in the mean following the treatment. The minimum score also reflects the lowest value, consistent with the previously assessed skills, while the maximum value remains at 3, as observed in the other skills analyzed. As confirmed by the average value in the results presented in Table 1, this skill exhibited a decrease of 0.15 points, making it the only skill assessed that showed a decline over time.

4.1.1.5 Skill 5- Phonological awareness: Sound matching results analysis

Sound matching was the final skill implemented in the series of five phonological awareness skills using Quizlet and BoomCards web tools. Figure N° 6 illustrates the results obtained by students during their pre- and post-test performances.

Figure 6 Analysis of "Sound matching" skill.



Source: Self elaboration.

As shown in Figure N°6, 50% of students consolidated their results after the implementation of the treatment, achieving a 100% in both tests. There were 14 % (student 8 and student 9) who showed an increment in their results from a starting value of 0 points to 2 and 3 points respectively. In the case of student 1 and student 3, their results denoted a decrease concerning their results obtained in the pre-intervention test from a starting value of 2 and 3 points to a final score of 0 and 2 points respectively.

Table N° 11 presents measures of central tendency regarding the use of “sound matching” skill.

Table 11 Measures of central tendency “Sound Matching skill”

Sound matching skill			
Descriptives			
	A	Pre intervention test	Post intervention test
N	14	14	14
Mean		2.29	2.57
Standard deviation		1.07	0.852
Minimum		0	0
Maximum		3	3

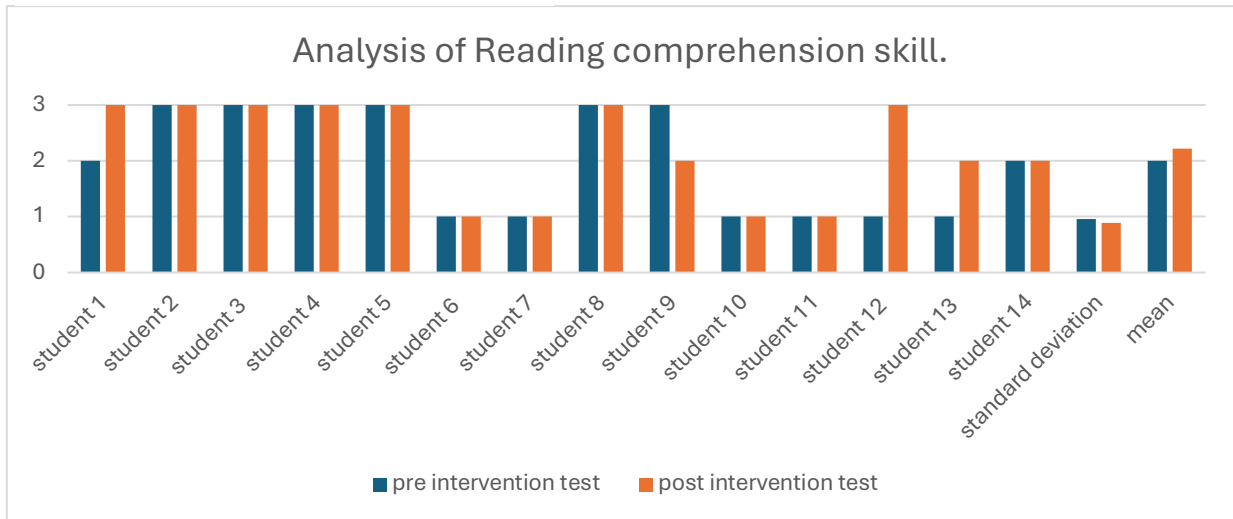
Source: Self elaboration.

Table N° 11 demonstrates an increase in the mean value observed in the post-test, indicating that scores improved and reflecting a higher level of achievement in student responses following the intervention. The standard deviation, which decreased by 0.218, suggests greater consistency in the responses provided by students in this skill after the intervention was implemented

4.1.1.6 Results analysis of reading comprehension for general information.

Reading comprehension was considered a crucial skill to observe during the implementation of the treatment since the main outcome was to analyze the students' improvement after the implementation of phonological awareness strategies.

Figure 7 Analysis of "Reading for gist" skill.



Source: Self elaboration.

As illustrated in Figure 7, a total of 5 participants (35%) demonstrated consistency in their results across both tests, achieving 100% proficiency in the reading skill. The data also indicated that 3 students (21% of the sample) showed improvement, with their post-intervention scores exceeding their initial values. Conversely, 1 student (7% of the sample) experienced a decline in performance; specifically, student N° 9's score decreased from 3 points in the pre-test to 2 points in the post-test.

These results suggest that reading skills are among the most stable competencies assessed, as evidenced by the fact that 10 students (71% of the sample) maintained their scores across both the pre- and post-tests.

Table 12 Measures of central tendency “Reading Comprehension” skill

Reading Comprehension Skill			
Descriptives			
	A	Pre Intervention Test	Post Intervention Test
N	14	14	14
Mean		2.00	2.21
Standard deviation		0.961	0.893
Minimum		1	1
Maximum		3	3

Source: Self elaboration.

With respect to the measures of central tendency, Table N° 12 presents the results obtained during the pre- and post-tests for the reading comprehension skill assessed in both evaluations.

As indicated in the table, there is an increase in the mean value of 0.21 points compared to the initial evaluation. Additionally, the standard deviation shows a decrease, suggesting a narrower range of responses among students. Notably, no students achieved a minimum score of 0, establishing a baseline score of 1 point for this skill. The maximum score remained consistent at 3 out of 3 points.

4.1.2 Global analysis of pre and post-intervention test results in all the skills assessed.

The following Table° 13 presents the results obtained by each student in both the pre- and post-intervention tests. These results provide a comprehensive overview of performance across all five skills, as well as the reading comprehension skill, which is considered an outcome influenced by the previously mentioned skills.

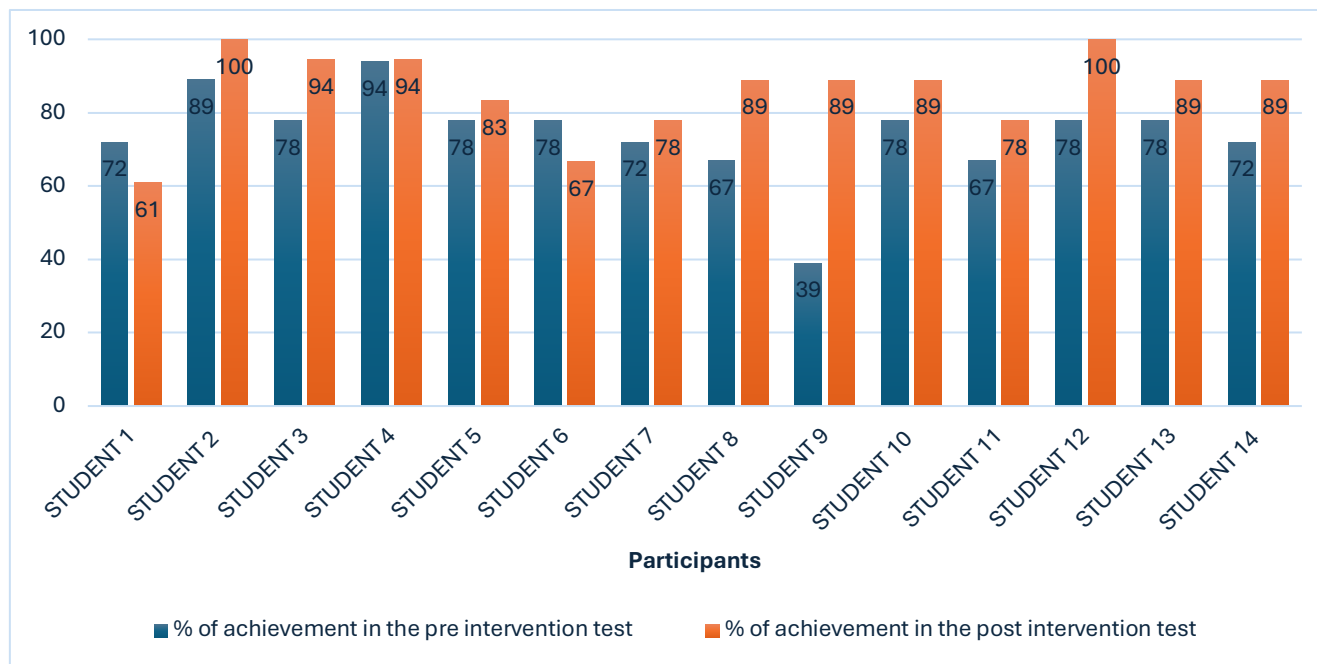
Table 13 Comparison of participants' performance during the pre and post intervention test.

	Pre intervention test	Percentage of achievement	Post intervention test	Percentage of achievement
Participants	Score 18 pts.		Score 18 pts.	
Student 1	13	72%	11	61%
Student 2	16	89%	18	100%
Student 3	14	78%	17	94%
Student 4	17	94%	17	94%
Student 5	14	78%	15	83%
Student 6	14	78%	12	67%
Student 7	13	72%	14	78%
Student 8	12	67%	16	89%
Student 9	7	39%	16	89%
Student 10	14	78%	16	89%
Student 11	12	67%	14	78%
Student 12	14	78%	18	100%
Student 13	14	78%	16	89%
Student 14	13	72%	16	89%
Score: Total	18			
Mean Score	13,35	74%	15,42	86%
Standard Deviation	2,2		2,0	

Source: Self-elaboration

Figure N° 8 represents the overall distribution of students' percentage of achievement during the pre and post-intervention test.

Figure 8 Students percentage of achievement during the pre and post intervention test.



Source: Self-elaboration

As it can be noticed in Figure N° 8, there was an emergent tendency to an improvement in the results obtained between the pre and post intervention test with a 74 % of achievement in the pre intervention test and an 86 % in the post intervention test. From a sample of 14 students, 11 of them (79%) showed a significant improvement after the intervention. Only 7 % of the students (1 student) kept the same results and 14% (2 students) decreased their results after the intervention. Students who exhibited a 79% of enhancement in their post-intervention results could be categorized according to the degree of engagement they showed during the intervention, which may have resulted in a higher level of participation and attendance to classes during the days the intervention took place and the opportunity to practice the phonological awareness skills constantly given the quantity of examples the apps provided to students. Another factor that influenced the decrease in the results in the case of students 1 and 6 was their absence from classes due to illness while the treatment was being applied.

As observed in Table N° 14 the mean value of 13.4 during the pre-intervention test, represents 74% which could be observed as a high percentage of achievement since the maximum score was 18. The mean value observed during the post intervention

test increased from 13,4 to 15.4, which represented an 86 % of achievement in comparison to the results obtained from the pre-intervention test.

Table 14 Measures of central tendency in the pre and post intervention test.

	pre intervention test	post intervention test
Mean	13.4	15.4
Standard deviation	2.27	2.06
Minimum	7.00	11.0
Maximum	17.0	18.0

Source: Self-elaboration.

With respect to standard deviation, the results indicated a difference of 2 points from the mean. Given the significance of these results, tests of normality were conducted to assess whether the findings were non-random and conformed to a normal distribution. In the context of this research, a paired samples t-test was performed (see Table N° 15).

Table 15 T test for paired samples to measure normality in the results.

Paired Samples T-Test					
Paired Samples T-Test					
		statistic	df	p	
pre intervention test	post intervention test	Student's t	-2.84	13.0	0.014

Note. $H_a \mu_{\text{Measure 1}} - \mu_{\text{Measure 2}} \neq 0$

Source: Self-elaboration.

As observed in Table N° 15 the results obtained from the T-test for paired samples yielded a p-value of less than 0.05, which suggests that the results were statistically significant.

4.2 Specific objective N°2: To analyze students' perceptions after doing phonological awareness activities on Quizlet and Boom app to improve their reading comprehension skills.

Two instruments were selected to gather data regarding students' perceptions after doing phonological awareness activities to improve their reading comprehension skills. The first consisted of a Likert scale survey, which was applied in two different stages of the intervention: one in the first session and the other after the last session. The second instrument selected was a focus group with six questions divided into three different dimensions regarding students' perceptions of the apps Boom and Quizlet, which they use to practice phonological awareness skills to improve their reading comprehension skills.

The results of the Likert scale provided relevant data to help were contrasted with the results obtained in the focus group interviews. This information allowed the teacher-researcher to observe the main tendencies in the measures of central tendency.

4.2.1 Analysis of Likert Scale Results-Session 1

The Likert scale implemented during this research consisted of a 5-level scale divided into 8 different statements. The scale included a scoring system which ranged from 1 to 5 points, being 1 a “strongly disagree” level and 5, indicating a “strongly agree” degree of perception. The statements were segmented into three different dimensions: Engagement and motivation, overall use of Quizlet and Boom tool in enhancing Phonological awareness skills & perceived impact on learning.

Table 16 Likert Scale Results Session 1

Participants Dimension	Engagement and motivation	% Engagement and Motivation	Overall use of Quizlet and BoomCards tool in enhancing P.A.	% Overall use of Quizlet and BoomCards tool in enhancing P.A.	Perceived impact on learning	% Perceived impact on learning
Student 1	15	100	10	100	15	100
Student 2	12	80	9	90	11	73
Student 3	15	100	9	90	15	100
Student 4	15	100	10	100	15	100
Student 5	14	93	9	90	15	100
Student 6	12	80	9	90	12	80
Student 7	14	93	10	100	15	100
Student 8	15	100	9	90	13	87
Student 9	15	100	10	100	14	93
Student 10	15	100	10	100	13	87
Student 11	14	93	6	60	13	87

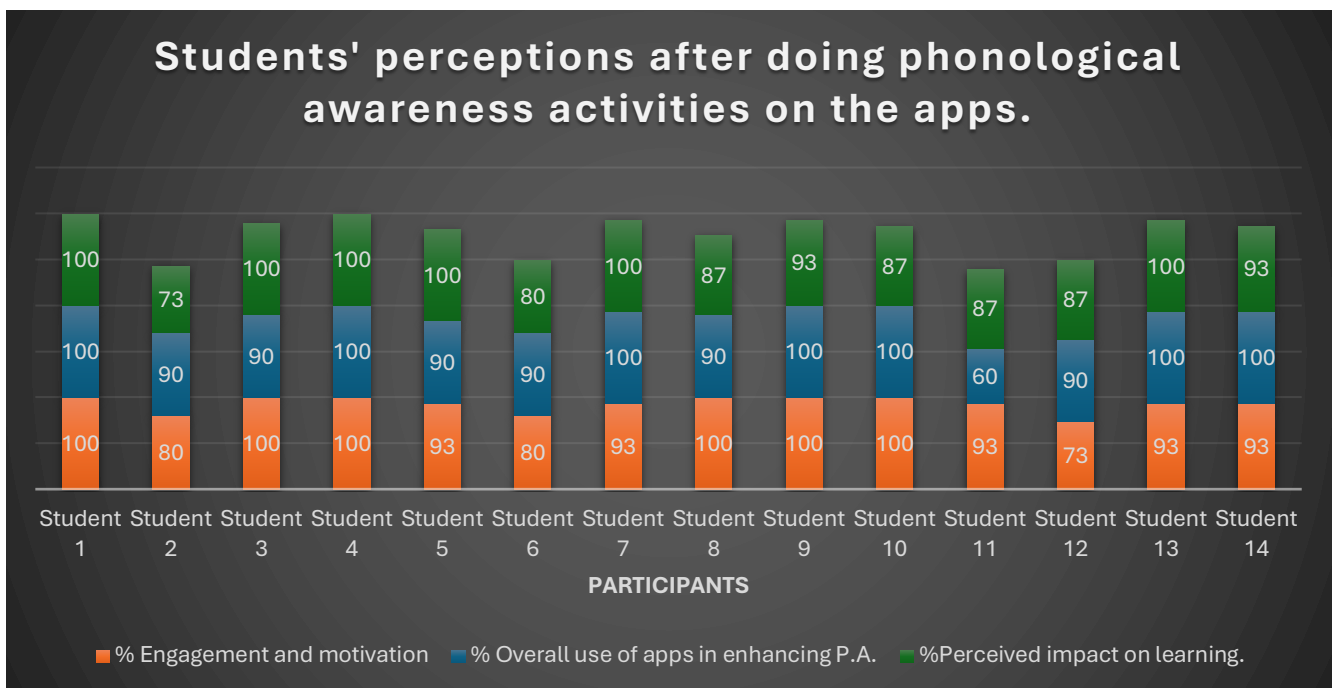
Student 12	11	73	9	90	13	87
Student 13	14	93	10	10	15	100
Student 14	14	93	10	10	14	93
Total Score	15	93	10	93	15	92
Media	13,93		9,29		13,79	
Standard deviation	1,328		1,069		1,311	

Source: Self-elaboration

The mean value for these dimensions was 13.98. Notably, the high results obtained in Dimension 1 (93%) and Dimension 3 (92%) also showed a slight increase in the standard deviation compared to Dimension 2, indicating a broader range of responses from students based on their personal perceptions. Since the results are considered within normal limits, including normalization tests for non-parametric results was unnecessary. Additionally, it is noted that Dimension 2: “Overall Use of Quizlet and Boom in Enhancing Phonological Awareness” exhibited a standard deviation of 1.069, suggesting a more consistent level of responses among participants.

A more detailed analysis of students’ individual results is presented in Figure 9.

Figure 9 Overall view of students’ perceptions per dimension in Likert scale 1.



Source: Self-elaboration

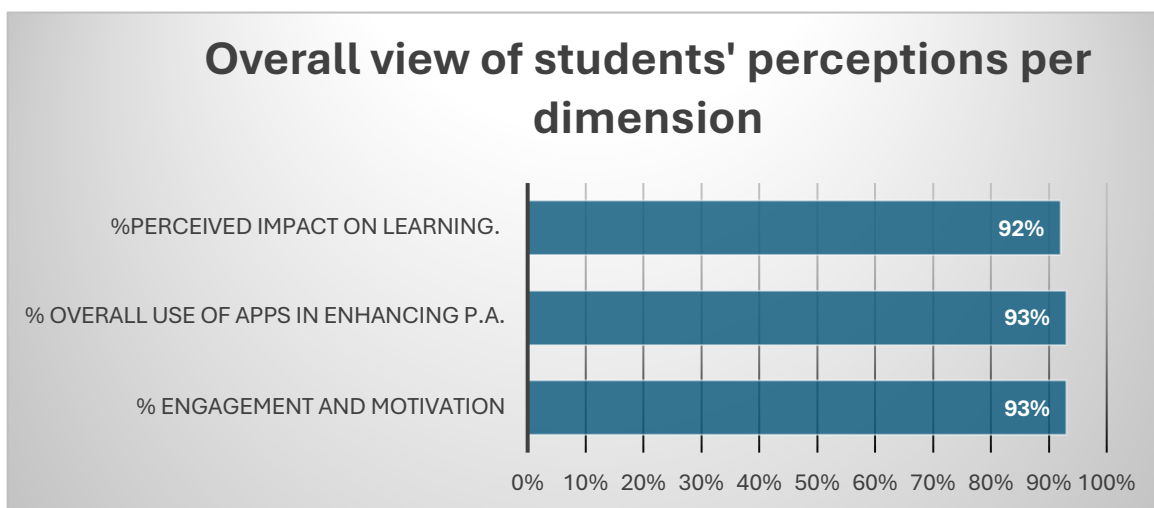
As demonstrated in Figure N° 9, one participant (P12) exhibited the lowest level of engagement and motivation following the intervention session (60%), in contrast to 6 students (43%) who demonstrated high levels of agreement (100%) in this dimension.

Regarding Dimension 2, "Overall Use of Quizlet and BoomCards in Enhancing Phonological Awareness," it is noteworthy that 7 participants (50% of the sample) achieved a score of 100%. According to this, Dimension 2 had the highest number of participants attaining the maximum score after the application of Likert Scale N° 1.

In Dimension 3, a total of 6 participants achieved a score of 100%. Conversely, Student 3 exhibited the lowest percentage of achievement in this dimension, which also corresponds to their lowest score across all three dimensions.

Additionally, it is noteworthy that, from the total sample of 14 students, two participants (14%) achieved a score of 100% across all assessed dimensions. Finally, Figure 10 presents an overall view of the results from the Likert Scale 1 regarding an overall view of students' perceptions per dimension, being represented by percentages of achievement on each of the three dimensions analyzed.

Figure 10 Overall view of students' perceptions per dimension.



Source: Self-elaboration

As mentioned previously, this indicates a high level of engagement in students' perceptions following the implementation of both apps Boomcards and Quizlet to teach phonological awareness during the starter session. The three percentages represent an overall view of the results obtained by the participants in terms of their perceptions once the first skill was implemented through Quizlet and BoomCards webtools.

4.2.1.2 Analysis of Likert scale results - Session 5

Table N°17 provides a detailed analysis of the students' results across each dimension of the Likert scale. In this section the analysis is focused on the Likert scale results applied after the last intervention to assess the use of phonological awareness skills through the apps BoomCards and Quizlet.

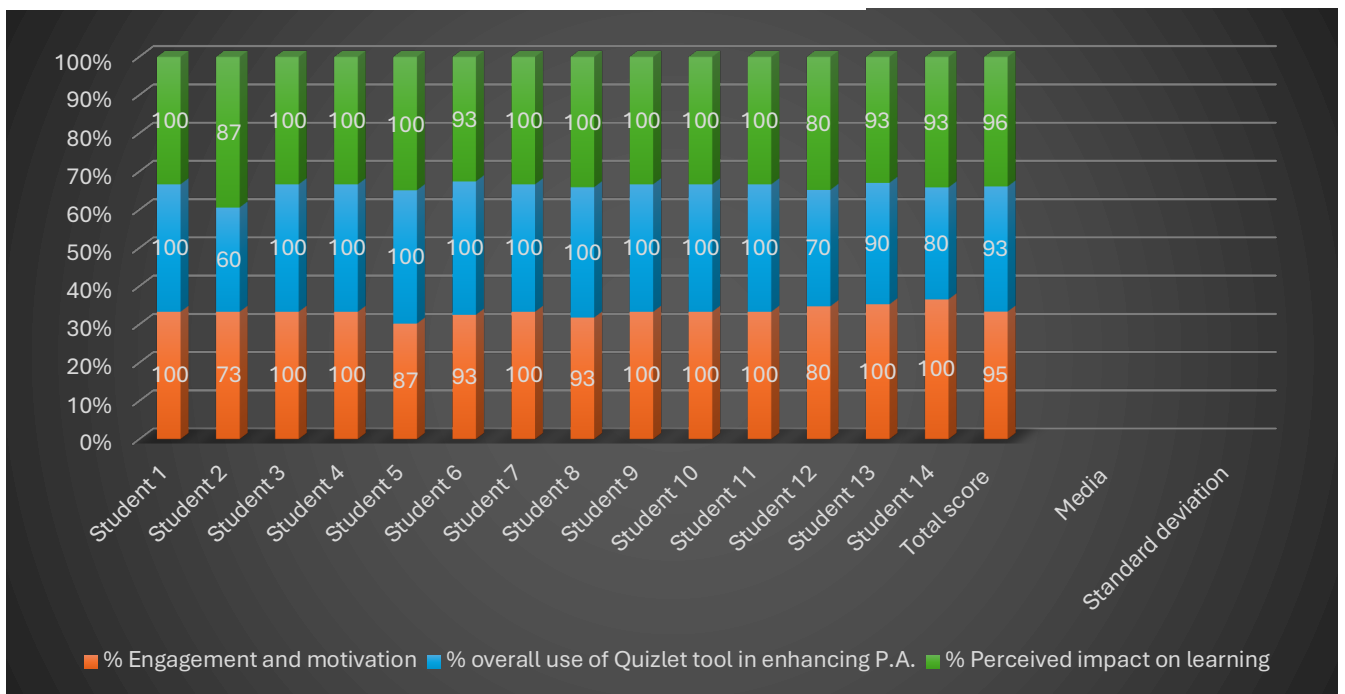
The consistency of responses varied among students. For instance, student 2 was the only participant who perceived the treatment as less effective, particularly concerning Dimension 1-Engagement and motivation (80% to 73%), as well as in Dimension 2- overall use of the apps in enhancing phonological awareness. (90 % to 0 %). Nevertheless, Student 2's perceptions regarding Dimension 3, which focuses on the perceived impact on learning, improved, suggesting that the treatment was regarded as effective in terms of the outcome of the third dimension this was demonstrated with an increase of 14 % between the first and the last application respectively. (73% to 87%)

Table 17 Likert scale results - Session 5

Participants Dimension	Engagement and motivation	% Engagement and Motivation	Overall use of Quizlet and BoomCards tool in enhancing P.A.	% Overall use of Quizlet and BoomCards tool in enhancing P.A.	Perceived impact on learning	% Perceived impact on learning
Student 1	15	100	10	100	15	100
Student 2	11	73	6	60	13	87
Student 3	15	100	10	100	15	100
Student 4	15	100	10	100	15	100
Student 5	13	87	10	100	15	100
Student 6	14	93	10	100	14	94
Student 7	15	100	10	100	15	100
Student 8	14	93	10	100	15	100
Student 9	15	100	10	100	15	100
Student 10	15	100	10	100	15	100
Student 11	15	100	10	100	15	100
Student 12	12	80	7	70	12	80
Student 13	15	100	9	90	14	93
Student 14	15	100	8	80	14	93
Total Score	15	95	10	93	15	96
Media	14,21			9,29	14,43	
Standard deviation	1,31			1,33	0,94	

Moreover, it is observable that the number of students that reached 100% of achievement in their results increased from 2 (14% of the sample) on the first Likert scale to 5 on the last one (50% of the sample). This impacted directly the dimensions of Engagement and Motivation with a mean value of 14,21 and Perceived impact on learning with 14,43, both with a mean difference of 0.28 and 0.64, respectively. Dimension “Overall use of the apps Quizlet and Boomcards” remained the same results.

Figure 11 Overall view of students' perceptions per dimension in Likert scale 2.



Source: Self-elaboration

As observed in Figure 11, there was a noticeable improvement on each of the three dimensions, Dimension N° 3: “*Perceived impact on learning*”, is the one that exhibited the highest improvement (92%) in relation to Likert scale N°1 results, applied in the first session. Dimension N° 1: “*Engagement and Motivation*”, and Dimension N°2: “*Overall Use of the Apps in Enhancing Phonological Awareness*” presented an increment in the mean value, and an increase in the standard deviation. This finding may indicate an overall enhancement in students' perceptions regarding the treatment applied, as well as a more diverse range in their responses across the three dimensions.

4.2.2 Focus group responses analysis

In order to complement the information gathered from the Specific Objective N° 2: To analyze students' perceptions after doing phonological awareness activities on Quizlet and Boom app to improve their reading comprehension skills, a focus group was implemented to obtain valuable information, and frequent topics mentioned by the participants, highlighting main themes and subthemes as well as examples for each. Responses were analyzed by using thematic analysis.

The focus group was structured around three distinct dimensions: engagement and motivation, the overall use of Quizlet and the Boom app to enhance phonological awareness skills, and the perceived impact on students' learning outcomes. Each dimension comprised two questions each, and were administered to three separate groups of students, drawn from a total sample of 14 participants. The information is displayed in Table N° 18

Table 18 Focus Group Responses Analysis

DIMENSION 1: Engagement and motivation			
Theme	Subtheme	frequency	Examples
Perceptions towards learning	Pleasure and enjoyment.	9	<p>Participant 2: <i>"me sentí cómoda y más divertido porque a veces las clases son aburridas y esta forma es más divertida"</i></p> <p>Participant 3: <i>"Se sintió bien porque era una forma entretenida de aprender contenidos que enseñó el profesor, no parecía una clase normal"</i></p> <p>Participant 4: <i>"Lo pasé bien porque era divertido y aprendí cosas nuevas"</i></p> <p>Participant 5: <i>"me gusto porque era divertido, aprendí y mis compañeros me ayudaron"</i></p> <p>Participant 7: <i>"Me gusto porque era como un juego, mis compañeros se involucraron en el juego para responder bien y se ponían nerviosos cuando se acaba el tiempo"</i></p> <p>Participant 11: <i>"encontré que se me hizo fácil aprender lo que enseñó y más divertidas las clases junto con entender y reconocer mejor las palabras en un texto"</i></p> <p>Participant 13: <i>"me sentí bien porque la app era divertida y algunas fotos eran chistosas"</i></p> <p>Participant 7: <i>"a mí me gusto y me motivo a aprender por que los colores eran llamativos y daban ganas de aprender"</i></p> <p>Participant 9: <i>"me pareció bien porque aprendíamos más en las clases por que hicimos más actividades que enseñan mejor"</i></p>
	Meaningful learning.	4	<p>Participant 1 <i>"me ayudo a aprender mejor, me sentí bien"</i></p>

			<p>Participant 5: <i>"Me sentí bien porque la aplicación decía los sonidos"</i></p> <p>Participant 8: <i>"Encontré que se me hizo fácil aprender lo que enseñó y más divertidas las clases junto con entender y reconocer mejor las palabras en un texto."</i></p> <p>Participant 13: <i>"Me pareció bien porque aprendíamos más en las clases por que hicimos más actividades que enseñan mejor y con la aplicación se entendía mejor."</i></p>
Improvement in comprehension and learning.	Better word recognition	7	<p>Participant 14: <i>"pude entender mejor y tuve más capacidad de entender y participar y eso me ayudo a entender más y aprender más las palabras y sus sonidos"</i></p> <p>Participant 3: <i>"encontré que se me hizo fácil aprender lo que enseñó y más divertidas las clases junto con entender y reconocer mejor las palabras en un texto"</i></p> <p>Participant 12: <i>"cuando el profesor enseñaba a formar una palabra me hizo entender que eso era antes que yo no sabía que era importante y ahora sé que lo es"</i></p> <p>Participant 1: <i>"sí me ayudo a aprender más como se hacen las sílabas en inglés"</i></p> <p>Participant 2: <i>"me ayudo a comprender algunas palabras que antes no comprendía en inglés por cómo se escribían y después me di cuenta que sí sabía el significado"</i></p> <p>Participant 6: <i>"me ayudo a aprender más el contenido e hizo que me motivara a aprender el contenido que enseñó el profesor"</i></p> <p>Participant 9: <i>"Puedes hacer mucho más que en el libro solo tenías que responder una pregunta y leyendo es como más aburrido y te da sueño"</i></p>
Participation engagement and	Motivation for participation and self-awareness	4	<p>Participant 11: <i>"me gusto porque era como un juego, mis compañeros se involucraron en el juego para responder bien y se ponían nerviosos"</i></p> <p>Participant 10: <i>"me ayudó y me motivó a participar más en clases empecé a dar más my opinión y me motivo a seguir aprendiendo durante toda la clase"</i></p>

			<p>Participant 4: <i>"Me motivó porque entendí mejor las palabras y reconocerlas"</i></p> <p>Participant 1: <i>"Me motivó poder participar y poder expresar lo que sentía preguntando más que lo que lo hacía antes"</i></p>
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DIMENSION 2: "Overall use of Quizlet and boom tools in enhancing phonological awareness"			
Theme	Subtheme	frequency	Examples
Most highlighted characteristics of Quizlet and BoomCards app	Sounds learning and pronunciation	7	<p>Participant 1: <i>"Lo que más recuerdo es que tiene sonidos, eso me ayudo a entender mejor lo que enseñó el profesor"</i></p> <p>Participant 3: <i>"yo recuerdo el sonido de las palabras que íbamos aprendiendo, después con eso, encontraba las palabras más fácil en el texto"</i></p> <p>Participant 6: <i>"Recuerdo lo de los sonidos, me ayudaba a saber cómo se hace una palabra"</i></p> <p>Participant 8: <i>"apretar los dibujos y las vocales y salían los sonidos y teníamos que unir el dibujo con la vocal inicial."</i></p> <p>Participant 14: <i>"Recuerdo que teníamos que escuchar palabras y silabas"</i></p> <p>Participant 10: <i>"Cuando había que escuchar palabras y silabas y luego formar una palabra, ahí entendía que yo me sabía esa palabra"</i></p> <p>Participant 1: <i>"Me acuerdo de los sonidos y las vocales que había que ir formando"</i></p>
	Pictures and colors support	6	<p>Participant 3: <i>"Yo recuerdo los dibujos y los colores que destacaban la foto, eso me llamaba la atención."</i></p> <p>Participant 6: <i>"A mí me gustaron los colores llamativos que tiene."</i></p> <p>Participant 3: <i>"Me acuerdo de que habían imágenes divertidas y fáciles para entender el significado de las palabras sin que las dijera el profesor"</i></p> <p>Participant 14: <i>"Me acuerdo de la función donde uno apretaba la pantalla y</i></p>

			<p><i>se daba vuelta la palabra mostrando un dibujo</i></p> <p>Participant 7: <i>“La que más me acuerdo, es la de las imágenes y las palabras que había que unir antes de que se acabará el tiempo”</i></p> <p>Participant 8: <i>“apretar los dibujos y las vocales y salían los sonidos y teníamos que unir el dibujo con la vocal inicial.”</i></p>
	Interactive activities	5	<p>Participant 7: <i>“La que más me acuerdo, es la de las imágenes y las palabras que había que unir antes de que se acabará el tiempo”</i></p> <p>Participant 8: <i>“apretar los dibujos y las vocales y salían los sonidos y teníamos que unir el dibujo con la vocal inicial.”</i></p> <p>Participant 14: <i>“Me acuerdo de la función donde uno apretaba la pantalla y se daba vuelta la palabra mostrando un dibujo”</i></p> <p>Participant 11: <i>“me gusto porque era como un juego, mis compañeros se involucraron en el juego para responder bien y se ponían nerviosos”</i></p> <p>Participant 14: <i>“Me acuerdo de la función donde uno apretaba la pantalla y se daba vuelta la palabra mostrando un dibujo”</i></p>
Most outstanding functions of the app	Separating and combining words and syllables	4	<p>Participant 8: <i>“apretar los dibujos y las vocales y salían los sonidos y teníamos que unir el dibujo con la vocal inicial.”</i></p> <p>Participant 7: <i>“La que más me acuerdo, es la de las imágenes y las palabras que había que unir antes de que se acabará el tiempo”</i></p> <p>Participant 11: <i>“Recuerdo lo de los sonidos y como se iban formando las palabras junto con cuando sonaban y reconocer las sílabas para unir las después.”</i></p> <p>Participant 13: <i>“Recuerdo que una vez teníamos que unir las sílabas para formar una palabra y otra vez tuvimos que separar la palabra en sus sílabas y era un poco diferente al Inglés”</i></p>
	Awareness of task instructions	3	<p>Participant 2: <i>“Escuchar, mirar para prestar atención a las cosas que nos preguntaba el profesor”</i></p>

			<p>Participant 4: “teníamos que mirar, oír, pensar...”</p> <p>Participant 7: “recuerdo la función donde aparecían los dibujos teníamos que pensar, mirar, y a veces escuchar con harta atención, ...”</p>
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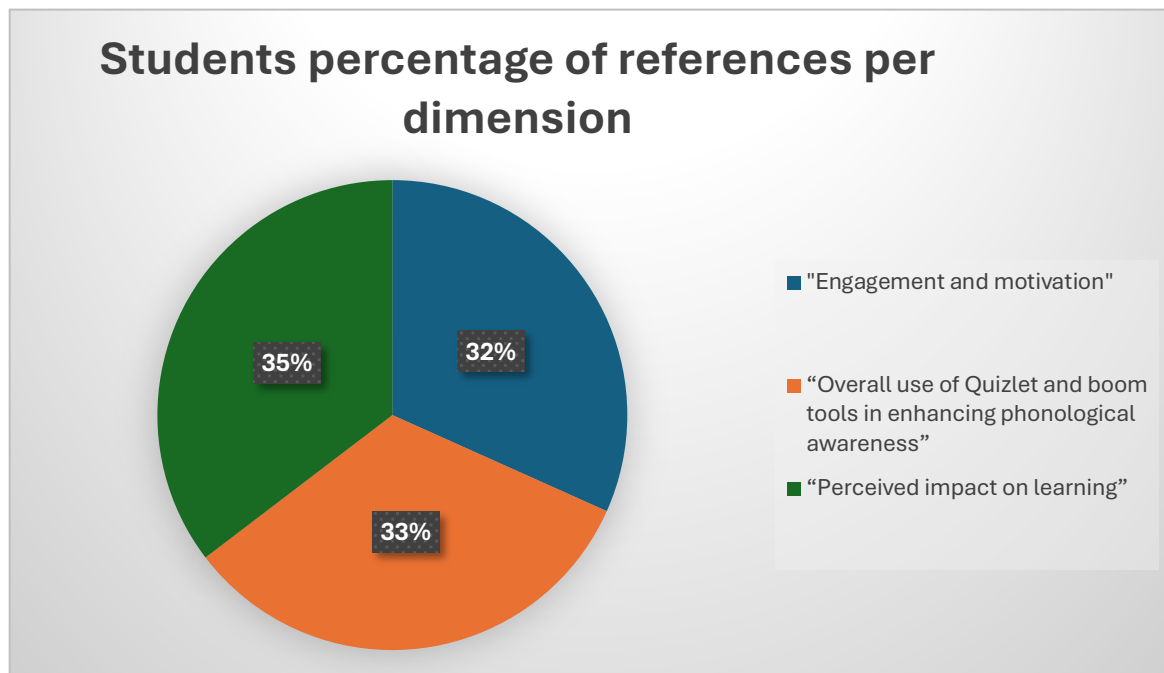
DIMENSION 3: “Perceived impact on learning”			
Theme	Subtheme	frequency	Examples
Impact on Sound Comprehension and Pronunciation.	Improvement in Sound Comprehension	6	<p>Participant 6: “me ayudó mucho a comprender los sonidos de las palabras.”</p> <p>Participant 12: “aprendí a leer mejor en inglés al intentar reconocer el sonido de la palabra y darme cuenta de que conocía esa palabra”</p> <p>Participant 3: “me ayudo a conectar el cómo se dice una palabra de cómo se escribe.”</p> <p>Participant 8: “Me sentí bien porque la aplicación decía los sonidos y eso me ayudaba a recordarla cuando tenía que leer después”.</p> <p>Participant 1: “me motivo porque entendí mejor las palabras y podía reconocerlas después”</p> <p>Participant 6: “encuentro que la aplicación me ayudó a sentirme más segura en resolver mis dudas de cuando uno no entiende por qué se dice diferente una palabra de como se escribe”</p>
	Increased self-confidence	4	<p>Participant 7: “ahora siento más confianza para pronunciar mejor.”</p> <p>Participant 14: “me ayudo más a entender que con otros métodos.”</p> <p>Participant 2: “me siento más capaz de leer y entender un texto porque practico las técnicas que me enseñó el profesor para pronunciar y entiendo que palabra es”</p> <p>Participant 3: “siento que ahora duró más leyendo, porque antes leía y no entendía una palabra, entonces hasta ahí quedaba, ahora puedo leer e intento pronunciarla para entenderla”</p>

	Word Recognition awareness	4	<p>Participant 1: "ahora puedo memorizármelas como se escriben."</p> <p>Participant 4: "me ayudo porque cuando tengo que leer texto comprendo más palabras."</p> <p>Participant 14: "ahora sé que algunas palabras se dicen diferente."</p> <p>Participant 3: "me ha ayudado a saber cómo se pronuncia o qué significan los sonidos, así lo entiendo más cuando me toca buscar la palabra en un texto"</p>
Contribution of strategies	Improvement in reading comprehension.	6	<p>Participant 5: "me ayudo a comprender mejor lo que dice un texto en inglés."</p> <p>Participant 3: "después de la actividad de la clase yo pude comprender mejor el texto.."</p> <p>Participant 7: "Si, ayuda porque son nuevas técnicas para poder leer y reconocer palabras que no entiendes..."</p> <p>Participant 5: "Si, te puede ayudar sobre todo cuando tenga que leer texto relacionado a cosas del colegio y a cosas relacionadas a lo que tenga que ver con nuestros propios gustos..."</p> <p>Participant 9: "me ayudo porque aprendí tecnicas y aprendi a leer mejor en inglés, porque cuando leíamos el texto habian palabras raras que no entendia, pero luego practicaba el sonido y lograba identificarlas mejor."</p> <p>Participant 1: por ejemplo cuando estaba haciendo el test, yo pude comprender mejor el texto porque yo recuerdo que la vez pasadas no pude entender bien el texto, pero después de la app pude entenderlo mejor.</p> <p>Participant 4: "me ayudo porque cuando tengo que leer texto comprendo más palabras."</p>
	Increase confidence and security when reading.	4	<p>Participant 2: "sí me ayudo, porque yo al principio no podía reconocer una palabra por que se decía diferente pero ahora sé que algunas palabras se dice diferente y me detengo a pensar como</p>

		<p><i>podría decirse y puedo avanzar en el texto.”</i></p> <p>Participant 6: <i>“encuentro que la aplicación me ayudó a sentirme más segura en resolver mis dudas de cuando uno no entiende por qué se dice diferente una palabra de como se escribe”</i></p> <p>Participant 2: <i>“me siento más capaz de leer y entender un texto porque practico las técnicas que me enseñó el profesor para pronunciar y entiendo que palabra es”</i></p>
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Figure N°12 represents students' frequent responses collected during the focus group interview.

Figure 12 Students percentage of references per dimension.



Source: Self-elaboration

A total of 82 references, which represent 100% of the responses provided by the participants across the thematic analysis, were identified. Of these, 26 references (31.7%) pertained to Dimension 1: "Engagement and Motivation." Additionally, 27

references (33%) aligned with Dimension 2: “Overall Use of Quizlet and Its Impact on Enhancing Phonological Awareness.” Finally, Dimension 3: “Perceived Impact on Learning” accounted for 29 references (35.4%) throughout the focus group process. These results correlate directly with those depicted in the Likert scale, indicating a tendency in students' perceptions regarding the learning outcomes of the treatment across all stages.

The most frequently cited subthemes within these dimensions were “Improvement in Sound Comprehension” and “Improved reading Comprehension,” each with a total of six references in the thematic analysis. Although Dimension 3, “Perceived Impact on Learning,” revealed the highest percentage of references, the most quoted subtheme was “Pleasure and Enjoyment” from Dimension 1, “Engagement and Motivation,” which had a total of nine references. This subtheme highlights students' engagement with the apps used to teach phonological awareness skills and the impact it might produce in their reading comprehension skills.

4.2.3 Audio logs

To gather data on the implementation of phonological awareness skills using Quizlet and BoomCards tools, aimed at enhancing the reading comprehension skills of a group of 4th graders, audio logs were employed as the primary data collection instrument. These audio logs provided a rich qualitative source of information, capturing the teacher researcher's reflections and insights throughout the intervention process. A thematic analysis was utilized to analyze this data, facilitating the identification of recurring themes and patterns in the researcher's responses. Additionally, a word cloud analysis was conducted to visually represent the frequency of key terms and concepts mentioned by the participants. This methodology not only deepened the understanding of the researcher's experiences but also highlighted areas of success and challenges encountered during the implementation of phonological awareness activities. For further analysis and accurate transcription of the recordings, as well as to establish the main codes discussed within them, the researcher utilized MAXQDA24 software, ensuring a thorough and appropriate analysis.

Table N°19 presents the results obtained by encoding the main findings after the transcription process. The table encloses the main codes or topics found during the transcription of the recordings and marks the recording where they were found the most.

Table 19 Audio logs Encoding results

Code Audiolog	Rhyme recognition	Segmentation	Blending	Syllable Awareness	Sound Matching
Reflective Practice	x	x	x	x	x
Students' Engagement	x	x		x	x
Webtools Usage	x		x		
Phonological Awareness Skills	x		x	x	
Researcher Anticipation			x	x	x
Researcher Adaptability	x	x	x	x	
Instructional Challenges	x		x	x	
Students' self- confidence		x	x		x

Source: Self-elaboration

As illustrated in Table N°19 the topics presented are the most frequently identified during the analysis of recordings conducted by the researcher using the software. The code "Reflective Practice" emerged as the most prevalent theme, appearing in all the researcher's recordings. Student engagement was the second most common topic, noted in four audio logs, which captured the researcher's observations regarding students' perceptions of the web tools and methodologies employed during the intervention.

Another recurring theme was the researcher's adaptability, highlighting the process of implementing the intervention despite various challenges, such as class suspensions, technical issues, and student absences due to different factors. The "Blending Skill" audio log encompassed a wide range of topics (7 out of 8 topics), presenting both challenges and insightful moments related to student motivation.

The topic "Instructional Challenges" was identified in audio logs "Rhyme Recognition," "Blending," and "Syllable Awareness," which directly correlates with the theme of "Web Tools Usage," noted in two of the aforementioned skills. Although "Web Tools Usage" did not appear in many audio logs, it was a consistent point of discussion for the researcher regarding the complexities encountered during implementation and the necessity to adapt lessons to address emerging needs to achieve desired outcomes.

Figure N° 12 presents the results of the word cloud analysis conducted on the audio logs collected during the intervention. This visual representation highlights the

contextualize the focus of the intervention. The presence of "Quizlet" indicates that this tool was a central element in facilitating phonological awareness activities, while "text" suggests an emphasis on reading materials used during the sessions. The inclusion of "research" implies a reflective approach to evaluating the effectiveness of these tools in enhancing students' learning outcomes.

Overall, this word cloud analysis not only visually represents the frequency of key concepts but also provides a thematic overview of the aspects most relevant to the implementation process. By focusing on these highlighted terms, research gained valuable insights into which elements of the intervention were most impactful and warrant further exploration.

Chapter V: Discussion

This study aimed to examine the contribution of teaching phonological awareness skills to a group of 4th-grade students using Quizlet and Boom cards to enhance their reading comprehension skills. Many students struggle with word recognition when reading, often failing to recognize the underlying sound patterns. Consequently, students could better identify sound patterns that inhibit the association between sound and print. Furthermore, students could benefit from the immediate feedback provided by CALL methods.

To gather data regarding the general objective of this research—examining the contribution of teaching phonological awareness skills through Quizlet and Boom Cards to the improvement of reading comprehension in a group of 4th graders—a pre and post-intervention test was conducted. This assessment evaluated students' reading comprehension levels before and after implementing the intervention.

Additionally, a Likert scale and focus group discussions were utilized to assess students' perceptions of the treatment's effectiveness and the engagement it fostered. Ultimately, audio logs were implemented and analyzed to facilitate reflection on the researcher's own practices and professional development, as well as to gather data pertinent to the main topics and issues encountered throughout the process. All data collected during the research were contrasted with current literature, as well as the main findings presented in the previous section of this action research. The following chapter provides implications for future practices and discusses the limitations encountered during the research.

5.1 Specific Objective N°1: To assess students' level of reading comprehension of a short passage after using phonological awareness skills implemented through Quizlet and BoomCards.

The results obtained from specific objective N° 1, which focused on assessing the enhancement of reading comprehension through the implementation of phonological awareness skills, suggests a marked improvement in student performance following the intervention. This finding aligns with Benyo's (2020) assertion regarding the efficacy of using Computer-Assisted Language Learning (CALL) methods to enhance both student and teacher performance. The mean scores from the pre- and post-intervention tests revealed an increase of 2.07 points, from 74% to 86% achievement, respectively. These results support the researcher's initial assumptions about the effectiveness of applying CALL methods in the classroom to teach phonological awareness skills for improving reading comprehension.

Additionally, the decrease in standard deviation from the pre-intervention test (2.2) compared to the post-intervention test (2.0) indicates a more consistent range of responses among participants, leading to more uniform outcomes. This consistency suggests not only the efficacy of the intervention but also the positive impact of implementing phonological awareness strategies in the classroom.

In the case of students 1 and 6, whose results exhibited a decrease from the pre- to post-intervention tests, absenteeism may have played a significant role in their performance. Both students were absent during the week when the treatment was applied due to illness and only attended the first and last sessions of the intervention. As a result, they completed only their pre- and post-intervention tests without fully participating in the treatment process. This lack of engagement may have contributed to their reduced scores, highlighting the potential impact of absenteeism on learning outcomes (Carnio, 2017)

5.2 Specific Objective N°2: To analyze students' perceptions after doing phonological awareness activities on Quizlet and Boomcards to improve their reading comprehension skills.

The analysis of students' perceptions regarding phonological awareness activities using Quizlet and BoomCards reveals both positive outcomes and areas for improvement across two different stages of the intervention, as assessed through Likert scale surveys and focus group sessions.

In the first session, students exhibited high levels of engagement and motivation, with mean scores of 93% in Dimension 1 (Engagement and Motivation) and 92% in Dimension 3 (Perceived Impact on Learning). However, the overall use of the apps to enhance phonological awareness skills showed a more consistent response among participants, with a standard deviation of 1.069. Notably, two students achieved a perfect score across all dimensions, indicating that while many students found value in the activities, there were variations in individual experiences. By the fifth session, there was a noticeable improvement in student perceptions, particularly in Dimension 3, which increased to 92%. The number of students achieving a perfect score rose from 2 (14% of the sample) to 5 (50%), suggesting that the intervention had a positive impact on their perceived learning outcomes. However, one student expressed a decrease in perceived effectiveness regarding engagement and motivation, highlighting that individual experiences can vary significantly even within a generally positive framework.

Phonological awareness taught through CALL methods supports the idea of presenting a new methodology that enhances learning and provides engagement to motivate students to acquire the language. As mentioned by Participant 3 during the focus group session: "encontré que se me hizo fácil aprender lo que enseñó y más divertidas las clases junto con entender y reconocer mejor las palabras en un texto" This aligns with Mduwile and Goswami (2024), stating that teaching should be presented in a way that enhances not only student motivation but also their connection with learning. Another characteristic emphasized by students regarding the application of Computer-Assisted Language Learning (CALL) methods during the intervention was the incorporation of audio and visual aids. This associates with

the notion that utilizing images can significantly enhance decoding skills. Through these methods, students not only improve their decoding abilities but also more effectively associate sounds with printed text, thereby facilitating the acquisition process. (Kosma, 1991, as cited in Benyo, 2020)

Furthermore, student perceptions gathered during the intervention indicated a mixed response to the phonological awareness activities. While some students expressed enjoyment and engagement with the interactive elements of Quizlet and BoomCards, others reported challenges in understanding how these activities directly translated to improved reading skills. This discrepancy points to the importance of not only implementing effective instructional strategies but also ensuring that students are able to make meaningful connections between their learning experiences and their reading development. Future practitioners should consider integrating explicit instruction on how phonological awareness skills relate to reading comprehension and provide ongoing support to help students navigate these connections.

5.3 Specific Objective N°3: To reflect on the process of implementing Phonological awareness skills using Quizlet and Boomcards app to improve a group of 4th graders' reading comprehension skills.

Regarding specific objective N° 3, which emphasizes the researcher's personal reflection on how the intervention process impacts his instructional practices, the analysis of word cloud results reveals a notable shift toward a student-centered approach. The analysis from the transcriptions indicate that the educator's methods increasingly prioritize elements that directly benefit and enhance students' performance in the classroom. This observation contrasts with the researcher's initial assumptions, which implicitly suggested that consistent practices resulted in a more mechanized, teacher-centered environment where activities primarily turned around the educator. Furthermore, throughout the intervention process, the presence of instructional and technological challenges led the researcher to adapt his teaching strategies to meet the class's needs better. As a result, the researcher not only transitioned to a more student-centered learning model but also empirically confirmed that student engagement was notably higher when learners were involved in addressing technical issues that arose during lessons. This collaborative problem-solving experience not only facilitated students' familiarity with the web tools but also fostered a sense of ownership over their learning process

Audio logs provided a substantial source of qualitative data that informed instructional practices. As noted by Verma (2021), "Audio diaries are unique in that they allow participants to break the rules of writing and literacy and permit them to share a rolling stream of consciousness that sheds light on the unique experiences and stories of the individual" (p. 1347). Thus, the researcher not only centered the learning experience on student progress but also opened a path for professional

development by addressing various aspects that contributed to an improved practice. For instance, discussions surrounding "instructional challenges" related to specific phonological skills—such as rhyme recognition and blending—offered valuable insights into areas requiring further technical support.

5.4 Research Limitations and implication for further research

5.4.1 Limitations of this study.

A limitation of the study may be related to the short length of the reading skill item across the test; this is seen as a limitation regarding the adaptation designed to assess this skill, as there are no tests that assess both PA and reading comprehension skills. This highlights the importance of creating a test that, as noted by Carnio (2017), considers the correlations between phonological awareness (PA) and sentence reading comprehension to illustrate the significance of this relationship in developing fluent reading and comprehension skills.

Despite the valuable insights gained from this action research project, several limitations should be acknowledged. For instance, the sample size of 4th graders in this study was relatively small, consisting of only 14 participants. This limited sample size may restrict the generalizability of the findings to a broader population. Smaller samples can lead to less reliable estimates of the effects observed, as they may not adequately represent the diversity of experiences and abilities found in larger or more varied groups. Consequently, while the results provide valuable insights into the specific cohort studied, they may not reflect the experiences of all 4th graders or students in different educational settings. Additionally, a small sample size increases the potential for variability in individual student responses, which can obscure patterns that might emerge in a larger group. Additionally, the reliance on self-reported data from audio logs could introduce bias, as the researcher may have been influenced by social desirability when sharing his experiences and perceptions.

Furthermore, external factors such as varying levels of prior knowledge and differing home environments may have impacted students' engagement and learning outcomes, making it challenging to isolate the effects of the implemented phonological awareness tools.

Lastly, the duration of the intervention may not have been sufficient to fully capture the long-term effects of using Quizlet and BoomCards on reading comprehension skills. As suggested by Bailey, 2020 that educational interventions often require extended periods to demonstrate significant and lasting impacts, as initial gains can diminish over time without ongoing reinforcement. A brief intervention may limit opportunities to observe these long-term benefits, as students might need more time to internalize and apply phonological awareness skills effectively. Additionally, the

absence of follow-up assessments post-intervention hinders understanding of how these skills translate into sustained improvements in reading comprehension. Future research should consider longer intervention durations and periodic assessments to provide a clearer picture of PA skills development and its influence on academic growth over time.

5.4.2 Implications for future practices

The use of instructional methods to teach phonological awareness skills have increased their demand in recent years, supported by current literature, phonological awareness has contributed directly to the acquisition of reading ability and has been sometimes, an underestimated skill to be taught previously to the teaching of the reading skill which may produce a delay in the acquisition of the skill in an EFL context mainly by the inability of students of associating sound to print. An appropriate implementation of this concepts into the EF Chilean context may be suggested for a near future in primary education.

The use of immediate feedback provided by CALL methods into the classroom gave students a clearer notion of the skills that were taught. It also provided immediate feedback to students which is, according to Lavolette et al. (2015) the most efficient way to provide input that enhances students from the mistakes they produced while learning the language. The tools used in the class directly impacted students' understanding of PA skills which, sometimes might be harder to understand without an empirical demonstration as it is when using CALL methods and the tools provided to students.

Future research with a more extensive and diverse participant pool would be beneficial to validate these findings and enhance their applicability across different contexts and populations

Chapter VI: Conclusions

6.1 Summary of main findings.

The following chapter presents all main findings obtained from the research and gathering data process, throughout the following, the researcher presents crucial aspects and contributions to the field in terms of the learning of phonological awareness skills to contribute to better reading comprehension skills through the decoding process.

Regarding the SO1: "To assess student's level of reading comprehension of a short passage after using phonological awareness skills implemented through Quizlet and BoomCards" presented an improvement in reading comprehension and consistency, this is mainly observed in the implementation of phonological awareness skills through Quizlet and BoomCards and how this resulted in a significant increase in student performance, with mean scores rising from 74% to 86%. Additionally, the decrease in standard deviation from the pre-intervention test (2.2) to the post-intervention test (2.0) indicates a more consistent range of responses among participants, suggesting that the intervention led to uniform outcomes across the group.

Some of the other factors that contributed to the findings regarding this objective was the impact of absenteeism on learning outcomes this is concluded through the performance of two students who experienced a decrease in their scores which may be attributed to absenteeism during the treatment period. Their limited participation highlights the potential influence of attendance on academic performance and underscores the importance of consistent engagement in learning activities.

Finally, the enhanced engagement through audio and visual aids revealed through students' reports that phonological awareness activities delivered via CALL methods increased their motivation and engagement in learning. The incorporation of audio and visual aids was particularly noted as beneficial, facilitating better decoding skills and helping students effectively associate sounds with printed text, thereby enhancing their overall reading comprehension experience.

In conclusion, while this study reveals some positive outcomes associated with phonological awareness activities, it also highlights significant areas requiring improvement. The limited progress in reading comprehension among most participants underscores the necessity for continuous research and the refinement of instructional methods, as well as the development of detailed assessment inventories that address common challenges in reading English as a Foreign Language (EFL) at this level. By targeting identified weaknesses in specific phonological skills, such as segmentation, and by fostering clearer connections between instructional activities and learning outcomes, educators can more effectively support EFL students in their pursuit of enhanced reading proficiency.

In relation to Specific Objective 2, which aimed to analyze students' perceptions after engaging in phonological awareness activities using the Quizlet and BoomCards apps to improve their reading comprehension skills, the findings indicate an overall positive impact. The implementation of these digital tools has generally enhanced student engagement and perceived learning outcomes, as evidenced by the increase in the number of students achieving perfect scores by the fifth session, suggesting that continued exposure to these resources fosters a more favorable perception of their effectiveness. However, individual variability in perceptions highlights the necessity for personalized approaches in instructional strategies; notably, one student's decline in perceived effectiveness underscores the importance of addressing diverse needs and experiences within the classroom. Furthermore, while students reported improvements in their perceptions of learning outcomes, the findings indicate a need for continuous refinement of instructional methods. This refinement should include integrating explicit connections between phonological awareness activities and reading comprehension skills to ensure that all students can effectively recognize and articulate the benefits of their learning experiences.

According to the SO 3 related to the personal reflection of the researcher regarding The implementation of phonological awareness skills using Quizlet and BoomCards. It resulted in a significant shift toward a student-centered instructional approach, emphasizing elements that directly enhance student performance. The presence of instructional and technological challenges necessitated the adaptation of teaching strategies, leading to increased student engagement, particularly when learners collaborated to address technical issues during lessons. This collaborative problem-solving fostered a sense of ownership over their learning process and facilitated greater familiarity with the digital tools used in the intervention. Additionally, audio logs provided valuable qualitative insights into the researcher's unique experiences and challenges, highlighting specific areas requiring further technical support, such as rhyme recognition and blending. Overall, this reflective process not only focused on student progress but also contributed to the researcher's professional development by identifying various aspects that enhanced instructional practices throughout the intervention

6.2 Personal reflection

Engaging in this action research project has been a profoundly meaningful experience for me as an educator, offering valuable insights into the implementation of phonological awareness skills using Quizlet and BoomCards. Throughout this process, I have appreciated the critical role that targeted interventions play in

enhancing students' abilities, specifically in reading comprehension. Initially, my approach to teaching reading relied heavily on conventional stages of reading instruction, which focused on guiding students through the mechanics of reading a book. However, I often overlooked the struggles they faced in associating sounds with words. This realization prompted me to reflect deeply on my instructional practices and seek more effective strategies to support my students in this area.

The implementation of phonological awareness activities through Computer-Assisted Language Learning (CALL) methods revealed significant findings that underscored the importance of addressing these foundational skills. Features like immediate feedback provided by these methods helped me understand the importance of providing students with suitable correction that enhances in real time their knowledge and enhances their skills according to their specific needs.

Although the implementation of action research focuses on enhancing a specific process within a particular context, it has provided me with a wealth of reflection and opportunities to improve my teaching practices. For instance, by utilizing audio logs, I was able to capture not only my reflections but also my beliefs and limitations during the intervention, significantly enriching my teaching practices at both the current level and in higher-grade classes.

The data collected also highlighted key themes such as student engagement and participation, which were instrumental in fostering a positive learning environment. It became evident that when students were actively involved in their learning—particularly through interactive tools like Quizlet and BoomCards—they demonstrated greater motivation and improved comprehension skills.

Moreover, this research showed me the necessity of adaptability in teaching practices. As I navigated various challenges—such as technical issues and diverse student needs, I learned to adjust my instructional strategies in real-time. This adaptability not only benefited my students, as confirmed by their perceptions regarding the intervention through focus group discussions and Likert Scale data but also contributed to my growth as a reflective practitioner. I noticed that being responsive to students' needs is crucial for creating an inclusive classroom where all learners can participate.

The implications of this action research extend beyond my classroom; they highlight the critical importance of continuous professional development and reflective practice within educational contexts. By engaging in action research, I can identify specific areas for improvement and implement evidence-based strategies that enhance student learning goals. This process has fostered a culture of inquiry among my colleagues and me, (since They were aware of the current process of research I was going through, and they decided to join it) encouraging us to critically examine our practices and make informed decisions that positively impact our students.

In conclusion, this action research project has profoundly influenced my understanding of effective reading instruction and reinforced the significance of phonological awareness in developing strong readers. It has encouraged me to move beyond traditional methods and embrace a more integrative approach to teaching that prioritizes foundational skills. As I continue my journey as an educator, I am committed to applying these insights to enhance my instructional practices and support all students in their EFL learning development.

6.3 Recommendations

Based on the findings from this action research project, several recommendations emerge for future practitioners and researchers in the field of reading instruction, particularly regarding the implementation of phonological awareness skills using digital tools like Quizlet and BoomCards. It is essential to expand sample sizes and incorporate diverse student populations to enhance the generalizability of results.

Additionally, extending the duration of interventions and incorporating follow-up assessments can provide insights into the long-term effects of phonological awareness activities on reading comprehension. Practitioners should foster collaborative learning environments that encourage peer interaction, as well as engage in continuous professional development to stay informed about effective instructional strategies. Reflective practices, including maintaining audio logs, can help educators critically assess their methods and adapt them to better meet students' needs.

Moreover, creating an English as a Foreign Language (EFL) inventory specifically designed for assessing phonological awareness skills is crucial in an EFL context. Such an inventory would provide a structured framework for evaluating students' abilities to associate sounds with words, thereby contributing to the overall improvement of their reading skills. By utilizing a variety of assessment tools and addressing potential technological challenges in implementing digital resources, educators can enhance their practices. Finally, these recommendations are intended to promote a more effective educational environment that supports all students in developing essential reading skills, particularly in EFL settings where phonological awareness is foundational to literacy development but is not always considered a skill to be taught in the EFL context.

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Appendix A: Pre and post intervention test

(Adapted from two peas phonological awareness assessment tool
www.hellotwopeas.com)

Name: _____		
Grade: _____	Date: _____	Teacher: _____

Section 1: Rhyme recognition.

1. Write YES if the words sound similar and NO if they sound different.

1.		cat	rat
2.		cold	hot
3.		car	Star
PRE			
Total points:			

Section 2: Segmentation

2. Write the letter of all the sound you recognize in the word

1.		junk
2.		snack
3.		fish
PRE		
Total points:		

Section 3: Blending

3. Listen to the spelling. Write the word.

1.	
2.	
3.	
PRE	
Total points:	

Section 4: Syllable awareness

“Read the word. How many syllables do you recognize?”

1.		butterfly
2.		magnet
3.		watermelon
PRE Total points:		

Section 5: Sound matching

What word has different initial sound? Write it down.

1.		wise, wacky, friend, woman
2.		juice, joke, jelly, fox
3.		light, phone, fence, field
PRE Total points:		

Section 6: Reading comprehension.

Read the text and answer the questions below.

I have breakfast at eight o'clock. I have cereal, milk, and a banana for breakfast. I have lunch at school, at half past one. I have meat, vegetables, and yoghurt for lunch. I have dinner at seven o'clock. I have soup and toast for dinner.



1. What does she have for breakfast? _____
2. What does she have for lunch? _____
3. What time does she have dinner? _____

Appendix B: Likert scale

Descriptor	Muy de acuerdo 	De acuerdo 	Medianamente de acuerdo 	En desacuerdo 	Muy en desacuerdo 
1. la aplicación que utilizó el profesor fue motivadora para aprender el contenido que enseñó.					
2. “Quizlet” y BoomCards me ayudaron a comprender mejor la estrategia que enseñó el profesor.					
3. La aplicación me motivó a aprender los contenidos que enseñó el profesor.					
4 Las aplicaciones Quizlet y BoomCards me ayudaron a mejorar las habilidades para aprender los sonidos de palabras que enseñó el profesor.					
5. ¿Considero que la aplicación me ha ayudado a reconocer mejor el sonido de las palabras y mis ganas de aprender estas?					
6. El uso de la aplicación, me ayudo a comprender mejor el concepto de “segmentation”					
7. Participar en actividades usando la aplicación, ¿ha mejorado mi capacidad para reconocer como se forma					

una palabra y sus sonidos en inglés?					
8.—¿Considero que usar la aplicación para entender como se forman las palabras en Inglés ha ayudado en mi lectura?					

Appendix C

Focus group.

Objective: To analyze students' perceptions after doing phonological awareness activities on Quizlet app to improve their reading comprehension skills.	
The structure of the focus group will be as follows:	
1. Welcome	(1 minute)
2. Brief explanation of the instrument to students, objectives, and dimensions.	(3minutes)
3. Begin questions and recording the interview.	(15 minutes)
4. Closing comments.	(1 minutes)

Dimension 1: Engagement and Motivation	1. ¿Como te sentiste usando la aplicación Quizlet para aprender un nuevo contenido?
	2. "¿Cómo te ayudó la aplicación Quizlet a aprender los sonidos de las palabras y las sílabas en inglés?"

Dimension 2: Overall use of Quizlet tool in enhancing Phonological Awareness	2. ¿Cuál es la característica que más recuerdas de la aplicación Quizlet y BoomCards?
	3. ¿ Que función de la aplicación Quizlet y BoomCards es la que más recuerdas y por que?

Dimension 3: Perceived Impact on Learning	4. Crees tu que usar Quizlet y BoomCards ha impactado en tu forma de aprender respecto a cómo formar sonidos de palabras en Inglés? ¿por que?
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	<p>5. Consideras que la práctica de habilidades para reconocer el sonido y formación de palabras a través de Quizlet ha contribuido a mejorar tu lectura en Inglés? De ser si tu respuesta, ¿Como lo ha hecho?</p>
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Appendix D

Audio logs

- **Objective:** - To reflect on the process of implementing Phonological awareness skills using Quizlet and BoomCards app to improve a group of 4th graders' reading comprehension skills.

Audio log entries will consider 2-3 minutes maximum length.

Dimensions

1. Implications of using Quizlet and BoomCards apps regarding the different phonological awareness skills implemented during the intervention plan.
2. Own professional development regarding the use of phonological awareness skills.

Date of recording	Recorded Yes/ No
1. Date:	
2. Date:	
3. Date:	

Validation instrument: Pre and post intervention test.

- **Objective:** To assess students' level of reading comprehension of a short passage after using phonological awareness skills implemented through Quizlet app.

Questions	Dimensions	Keep	Delete	Modify	Observations
Section 1: Rhyme recognition. 1. Write YES if the words sound similar and NO if they sound different.	Rhyme recognition.				
Section 2: Segmentation 2. Write the letter of all the sound you recognize in the word	Segmentation				
Section 3: Blending 3. Listen to the spelling. Write the word.	Blending				
Section 4: Syllable awareness 4. "Read the word. How many syllables do you recognize?	Syllable awareness				
Section 5: Sound matching 5. What word has different initial sound? Write it down.	Sound matching				
Section 6: Reading comprehension. 6. Read the text and answer the questions below.	Reading comprehension				

Validation instrument: Focus group

OBJECTIVE: To analyze students' perceptions after doing phonological awareness activities on Quizlet and BoomCards app to improve their reading comprehension skills.

Questions	Dimensions	Keep	Delete	Modify	Observations
1. ¿Como te sentiste usando la aplicación Quizlet para aprender un nuevo contenido?	Engagement and Motivation				
2. "¿Cómo te ayudó la aplicación Quizlet a aprender los sonidos de las palabras y las sílabas en inglés?"					
3.Cual es la característica que más recuerdas de la aplicación Quizlet?	Overall use of Quizlet tool in enhancing Phonological Awareness				
4.¿ Que función de la aplicación Quizlet es la que mas recuerdas y por que?					
5.Crees tu que usar Quizlet ha impactado en tu forma de aprender respecto a cómo formar sonidos de palabras en Inglés? ¿por que?	Perceived Impact on Learning				
6.Consideras que la practica de habilidades para reconocer el sonido y formación de palabras a traves de Quizlet ha contribuido a mejorar tu lectura en Inglés? De ser si tu respuesta, ¿Como lo ha hecho?					

Validation instrument: Likert scale

- **Objective:** To analyze students' perceptions after doing phonological awareness activities on Quizlet app to improve their reading comprehension.

Questions	Dimensions	Keep	Delete	Modify	Observations
1. la aplicación que utilizó el profesor fue motivadora para aprender el contenido que enseñó.	Engagement and Motivation				
2. "Quizlet" me ayudó a comprender mejor la estrategia que enseñó el profesor.					
3. La aplicación me motivó a aprender los contenidos que enseñó el profesor.					
4 La aplicación Quizlet me ayudó a mejorar las habilidades para aprender los sonidos de palabras que enseñó el profesor.	Overall use of Quizlet tool in enhancing P.A.				
5. ¿Considero que la aplicación me ha ayudado a reconocer mejor el sonido de las palabras y mis ganas de aprender estas?					
6. "El uso de la aplicación, me ayudo a comprender mejor el concepto de "segmentation"	Perceived impact on learning				
7. Participar en actividades usando la aplicación, ¿ha mejorado mi capacidad para reconocer como se forma una palabra y sus sonidos en inglés?					
¿Considero que usar la aplicación para entender como se forman las palabras en Inglés ha ayudado en mi lectura?					