

# Approximation to the Use of the Color Vowel ® Approach to Foster 4th Graders' Decoding Skills for Vowels /i:/, /u/, /eɪ/, and /aʊ/

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#### Abstract

This action research study focuses on an approximation to the use of the Color Vowel (approach to enhance learners' decoding skills. Teaching young learners to read in a second language, identify spellings and sounds that may differ from their first language, and develop phonological awareness poses a significant and challenging task that demands thoughtful consideration. This study was conducted in a subsidized school in Talcahuano, Chile. Data was collected from a group of 4th-grade students using a checklist as a pre- and post-intervention test to analyze their decoding skills, along with a Likert scale and focus group to identify their perceptions on the use of the strategy. The results showed that the Color Vowel (approach improved learners' decoding skills, particularly in developing and accurately producing vowel sounds among 4th graders. Additionally, the students expressed positive perceptions of this approach, highlighting the importance of learning English pronunciation for their daily and future lives. These findings could shed light on the importance of explicit phonological awareness instruction, as well as the significance of considering young learners' voices about the implications that language learning has on their lives.

Keywords: EFL, decoding, phonological awareness, young learners, Color Vowel ®

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# Una aproximación al uso del enfoque Color Vowel ® para fomentar las habilidades de decodificación de los alumnos de 4º grado de las vocales /i:/, /u/, /eɪ/ y /aʊ/

### Resumen

La presente investigación-acción se centra en una aproximación al uso del enfoque Color Vowel ® para mejorar las habilidades de decodificación en estudiantes de primaria. Enseñar a los niños a leer en una segunda lengua, así como identificar la ortografía y los sonidos en inglés y desarrollar la conciencia fonológica, representa una tarea desafiante que requiere una cuidadosa consideración. Esta investigación-acción se llevó a cabo en una escuela subvencionada de Talcahuano, Chile. Se recolectaron datos de un grupo de estudiantes de 4º básico utilizando una lista de cotejo como prueba pre y post intervención para analizar sus habilidades de decodificación. Además, se emplearon una escala Likert y un Focus Group para identificar las percepciones de los estudiantes sobre el uso de la estrategia. Los resultados mostraron que el uso del enfoque Color Vowel ® fue beneficioso para las habilidades de decodificación de los estudiantes. Además, los estudiantes expresaron una percepción positiva sobre el uso de este enfoque, destacando la importancia del aprendizaje de la pronunciación en inglés en su vida cotidiana y futura. Estos resultados podrían arrojar luz sobre la importancia de la enseñanza explícita de la conciencia fonológica, así como sobre la importancia de tener en cuenta las opiniones de los jóvenes estudiantes sobre las implicaciones que el aprendizaje de idiomas tiene en sus vidas.

Palabras clave: EFL, decodificación, conciencia fonológica, estudiantes de primaria

# Introduction

This action research project focused on improving decoding skills among 4th-grade learners of English as a Foreign Language (EFL) in the educational setting of a subsidized school in Talcahuano, Chile. Decoding is a "process [that] refers to the process of saying printed words into a representation similar to oral language either silently or aloud" (Budiharso, 2014, p. 189), and early learners use it to identify words and approximate their spelling (<u>McShane, 2005</u>). In addition, phonological awareness refers to recognizing and manipulating sounds in spoken language and plays a crucial role in decoding, blending, and reading words (<u>US National Reading Panel, 2000</u>).

While comprehensive in their approach to language learning objective, the Chilean national curriculum guidelines lack explicit opportunities to enhance decoding skills. Although the curriculum mentions tasks like reproducing chants, songs, and dialogues to familiarize students with English sounds (<u>MINEDUC, 2015</u>), it does not offer a systematic strategy for improving decoding skills and fails to address decoding skills in depth.

Despite these curriculum guidelines, 4th-grade students continue to face challenges when it comes to decoding vowels. The lack of a profound and systematic approach to pronunciation and spelling is a prevalent issue in EFL teaching (Bayu & Mustafa, 2019). Furthermore, there are no activities designed to develop phonological awareness, which is crucial for sound combinations and word classifications. Classroom activities do not adequately support the practice and improvement of decoding skills. Additionally, the coursebook students use, *Be Curious 4* by Cambridge University Press (2020), focuses primarily on grammar and vocabulary, with limited opportunities for practicing spelling and pronunciation. The fact that English has a deep orthography—meaning there is often a lack of correspondence between the spelling and the pronunciation—contributes to this situation (<u>Miller, 2019</u>).

Furthermore, young learners from the described school context have expressed their frustration at not knowing how to pronounce words correctly, which has led to a reluctance to read or speak aloud. This challenge requires an effective approach to address these issues, particularly regarding vowel sounds and their combinations. In this sense, the Color Vowel ® approach offers an encouraging solution. This system enables young learners to associate specific vowel combination sounds with colors (Taylor & Thompson, 2016). Ultimately, the implementation of this system could yield beneficial results and encourage young learners to gain confidence when reading aloud.

# **Theoretical Framework**

#### Multisensory and Multicognitive Learning and the Chilean Educational Context

The multisensory and multicognitive learning approach proposed by <u>Odisho (2007)</u> emphasizes engaging multiple sensory modalities—auditory, visual, and kinesthetic—to enhance pronunciation skills. <u>(Inderhill (2005)</u> supports this approach, recognizing its multidimensional nature. The Multisensory, Multicognitive Approach (MMA) acknowledges the significance of auditory, visual, and tactile-kinesthetic modalities in speech perception and production. <u>Odisho (2007)</u> outlines a sequence of orientations: cognitive, auditory, visual, and tactile-kinesthetic, as illustrated in Figure <u>1</u>. Cognitive orientation prepares learners to recognize pronunciation problems, while auditory orientation develops their perception of vowel quality and quantity. Visual orientation focuses on the visual aspect of pronunciation, highlighting facial gestures and mouth shape during demonstrations. Tactile-kinesthetic orientation incorporates tactile and kinesthetic activities, such as physical exercises and manipulation of articulatory organs, to enhance learners' pronunciation skills.

The MMA is highly relevant for the current Chilean educational system, which aims at providing equal opportunities for access, participation, and progress in the essential learning objectives of the national curriculum. It considers the potential of each student and promotes diversified teaching as a response to the diversity of students in the classroom (<u>MINEDUC, 2015b</u>). Through the School Integration Program and the 83<sup>rd</sup> Decree (Decreto N° 83/2015, <u>MINEDUC, 2015b</u>), it is expected to foster the diversification of education in preschool and primary education, especially for students with special educational needs. The main objective of the 83<sup>rd</sup> Decree is to promote the transformation of pedagogical practices among regular education teachers by incorporating Universal Design for Learning (<u>Valencia & Hernández, 2017</u>).

Figure 1. Odisho's (2007) Sequence of Orientations for Pronunciation Instruction



The UDL is an educational approach that recognizes the diversity in students' learning processes, acknowledging that each child and adolescent learns in a unique way and benefits from differentiated teaching approaches in the classroom. This framework focuses on adapting educational practices, spaces, and materials to meet individual learning needs in flexible school environments (<u>Diseño Universal Para El Aprendizaje y Libros de Texto Digitales Accesibles, 2022</u>), providing multiple means of engagement, representation, and action and expression to "ensure

that all learners can access and participate in meaningful, challenging learning opportunities" (CAST, 2018).

#### Figure 2. UDL guidelines



### Source: CAST (2018)

According to <u>Valencia and Hernández (2017</u>), implementing the principles of the UDL in teachers' practices is a governmental objective in Chile, reflecting the country's commitment to educational inclusion. To achieve this, it is crucial that current and future teachers, as well as all members of the educational community are adequately prepared.

In light of this information, it is essential to address these factors, as they may affect the language learning process of young learners and could be directly related to students' learning preferences and needs.

# Pronunciation Instruction in the Chilean Curriculum for English as a Foreign Language (EFL), Phonological Awareness and Decoding Skills Development

Chilean classrooms typically have an average of 34 students per classroom in government-dependent private educational institutions, such as subsidized schools, and 31 students in all public and private educational institutions (<u>OECD, 2023</u>). The Ministry of Education provides curriculum guidelines for EFL as part of primary education, including 4<sup>th</sup> grade. These guidelines focus on the development of four language skills: reading, listening, speaking, and writing.

Regarding pronunciation instruction, the guidelines provide learning objectives, class activities, and assessment examples. They note that English does not have a direct letter-sound correspondence, leading to various possible pronunciations of words. However, these combinations are limited, with the most frequent ones being relatively easy to learn (<u>MINEDUC, 2015</u>). Young learners can identify these combinations and associate them with new words.

For example, knowing the word "cow" helps learners understand the pronunciation of words like "bow" or "plow" (<u>MINEDUC, 2015b</u>). While this illustrates some phonological awareness, it may not apply to all words, such as "low," "slow," or "blow." The Chilean EFL curriculum guidelines recognize the importance of intelligible pronunciation for effective communication in English. However, concerns about the limited emphasis on decoding skills and pronunciation, as pointed out by <u>Martínez and Zurita (2020</u>), suggest that insufficient time may be allocated to developing students' pronunciation skills. Given the number of students in each classroom, it is vital to explore ways to ensure that decoding instruction effectively reaches every learner.

Research underscores the significance of vowel recognition and production in language acquisition (<u>Ghorbani et al., 2016</u>; <u>Nguyen et al., 2021</u>). <u>Nguyen et al., (2021</u>) further emphasize that explicit teaching and practice of vowel sounds can significantly improve learners' ability to perceive and produce them accurately, ultimately enhancing overall oral communication skills. The authors also point out that incorrect vowel production negatively affects comprehensibility, undermining a speaker's intelligibility. Likewise, inaccurate pronunciation of vowel sounds can lead to misinterpretation in oral communication, increasing the risk of conveying unintended messages and causing listener confusion.

Phonological awareness plays a crucial role in developing decoding skills, which will enable speakers to accurately produce vowel sounds and combinations. It involves recognizing and manipulating sounds in spoken language, a critical component of reading development (<u>National Reading Panel (US, 2000</u>). Phonological awareness encompasses skills such as phoneme understanding, rhyme detection, syllable segmentation, and pattern recognition. These skills develop alongside early literacy and are vital for fluent reading and language comprehension.

Decoding involves understanding how graphemes represent phonemes. While these relationships are generally consistent, they can vary across different word spellings. Numerous studies have demonstrated the effectiveness of explicit phonological awareness instruction for language learners, even when integrated into regular classrooms. For instance, an experimental study carried out by <u>Al-Tamimi and Rabab'Ah (2007)</u> examined the effect of phonological awareness instruction on word-reading ability among 145 EFL first-graders in a Jordanian state school. The researchers developed a phonological awareness training program and implemented it with the experimental group. After 10 training sessions, the experimental group showed significantly better performance in word-reading ability compared to the control group. The study concludes that phonological awareness plays a crucial role in the development of word-reading ability among first graders, emphasizing the importance of explicit phonological awareness instruction for their progress.

Overall, phonological awareness seems to be closely linked to the development of sound pronunciation and decoding skills, which can enhance language development and communication for EFL learners (<u>National Reading</u> <u>Panel US, 2000</u>). Therefore, identifying teaching strategies that support young language learners with diverse learning needs is crucial for the meaningful and effective development of their English skills.

# The Color Vowel ® Approach

Spoken English relies on the combination of rhythm and melody, and this interplay is known as prosody. Prosody helps listeners identify the most important words in a phrase or sentence, which are closely related to stressed and unstressed syllables (<u>Gilbert, 2008</u>).

Figure 3 illustrates the functioning of the English stress system. At the base of the pyramid is the thought group, which can be a phrase, clause, or sentence. The focus word represents the most important word within a thought group, usually a content word. The peak syllable of the focus word is stressed, with the vowel in this syllable serving as the peak of information. Stressed syllables are crucial; they must be lengthened and articulated clearly, as they convey the core meaning of the thought group. In contrast, the remaining components of the thought group should be softened (<u>Gilbert, 2008</u>).



Figure 3. The Prosody Pyramid

#### Source: Gilbert (2008)

According to the Color Vowel ® Approach, stress occurs at the word level, meaning that each English word can be associated with one color (Taylor & Thompson, 2017). When students learn a new word, it is crucial for them to identify the peak syllable and understand the stress pattern of that word. Therefore, teachers should direct students' attention on the use of length, clarity, and pitch. This emphasis is essential, as stressed syllables in English are longer than unstressed syllables, whereas in Spanish tend to be relatively equal in length (<u>Gilbert, 2008</u>).

The challenge of unstressed syllables is particularly pronounced for Spanish speakers, as there is no letter in the Spanish alphabet that represents reduced vowels found in English. While the schwa sound—represented by the /ə/ symbol—exists, it functions to reduce less important vowels, allowing peak vowels to be more easily distinguished. This is an essential element of contrastive stress. For example, the words "banana" or "Canada" are familiar to Spanish speakers but are pronounced differently in English: /bənˈæ nə / and /kˈæ nədə/, compared to /banˈana/ and /kanˈaða/ in Spanish.

The Color Vowel ® Approach emphasizes the stressed syllables of the focus word within the thought group so they are given a specific color that matches their vowel sound.

As shown in Figure 4, each key word is associated to a color that represents the sound of the peak vowel at the word or phrase level.





This chart is a valuable tool for teachers, as it helps learners focus on word and phrase stress, enabling them to first identify and then produce the rhythm that characterizes spoken English. Consequently, each letter—or combination of letters—may represent multiple vowel sounds, making it challenging to determine a word's pronunciation based solely on its spelling (Taylor & Thompson, 2016). The chart shifts the emphasis away from spelling, which can often be misleading. For instance, the letter "o" is pronounced differently in words such as *to*, *so*, *on*, *of*, *woman*, *women*, or *work*. Each color of the Color Vowel ® Chart corresponds to a specific vowel sound, with each sound associated with a color name and a key anchor phrase to help students remember the pronunciation of words. For example, the color *blue* is linked to the key word *moon*, both of which share the same vowel sound /u/, as found in words like *true*, *balloon*, or *approve*. These words have different spelling patterns but share the same vowel sound.

This shows the relevance of bearing in mind a basic rule of spoken English: every word has one primary stressed syllable, characterized by a strong, lengthened vowel sound at its core. By using The Color Vowel ® Chart to assign a color to that vowel sound, it can be said that each word has a single color (Taylor & Thompson, 2016).

The shape of the chart mirrors the shape of the vocal tract, with GREEN representing the high front vowel /i/, OLIVE the low central vowel /a/, and BLUE exemplifying the high back vowel /u/. This visual representation helps learners understand the connections between different vowel sounds and how they form in the mouth, eliminating the need for terms like low, central, or high vowels.

Moreover, English vowels can be categorized into two types: moving vowel sounds and non-moving (still) vowel sounds. Moving vowels shift in one of two directions: towards "y" or towards "w." Vowels moving towards "y" move towards the top left corner of the chart (as in GRAY and WHITE), whereas vowels moving towards "w" move to the top right corner (as in ROSE and BROWN). Thus, "y" and "w" indicate the direction of the vowel's movement (Taylor & Thompson, 2016). The Color Vowel ® Approach recommends that beginning students work with a limited number of colors at a time. Activities may include identifying the color of words and phrases according to their stressed vowel sound, categorizing words or phrases by color, or identifying the color associated with learners' names.

On this basis, the Color Vowel ® Approach enables students to visualize and remember the pronunciation of words through color associations. This method not only aids in pronunciation but also enhances students' ability to decode unfamiliar words, bridging the gap between spelling and sound. As a result, students develop a more intuitive understanding of English prosody, which contributes to greater fluency in their speech. Given that the Color Vowel ® approach uses a visual and color-based system for representing vowel sounds, it offers significant advantages in terms of diversified education. This approach aligns with the principles of Universal Design for Learning (UDL), which emphasizes the importance of presenting information in multiple ways to meet the diverse needs of learners. Furthermore, the Color Vowel ® approach respects the individual learning preferences and requirements of each student by incorporating various teaching methods, including auditory, spoken, visual, and physical approaches for pronunciation instruction. The spoken and physical elements of the Color Vowel ® approach encourage active involvement and hands-on participation, enabling students to engage actively with the material, consistent with the fundamental principles of UDL.

This approach also addresses the varied learning preferences and individual student needs, thereby enhancing the accessibility of decoding skills development. As a result, it not only simplifies the learning process but also contributes to the creation of a more inclusive and diverse learning environment. This is particularly beneficial for young language learners in Chile, where diversity and inclusion are at the heart of educational objectives.

# Providing Equal Opportunities for Participation by Listening to Children's Voices

The Chilean educational context aims at providing learners with diverse and equal opportunities for engaging and participating in their learning processes. However, research on children often focuses on adult-centered topics, overlooking children's perspectives. It has been argued that children can challenge experts' beliefs and provide new perspectives (<u>Pinter, 2014</u>). Thus, to gain deeper insights about their learning experiences, it is essential to build new relationships between adults and children. In this regard, <u>Kucha and Pinter (2012)</u> argue that overcoming power barriers can lead to different views that teachers may not know about. Various studies have provided important

observations regarding students' perceptions about language learning (<u>Shrestha, 2013</u>) and pronunciation teaching (<u>Burri, 2023</u>; <u>Modesti, 2016</u>; <u>Tergujeff, 2013</u>), uncovering valuable insights into these topics. For instance, a study by <u>Modesti (2016</u>) examined students' perceptions of learning English and pronunciation in three public primary schools in Italy, involving 227 students aged 8 to 10 years. Nearly half of the participants (40.5%) reported feeling uncomfortable when speaking English, while 6.2% always feeling this way. Additionally, almost 75% found it difficult to pronounce English words. The study also revealed that most students recognized the difficulties associated with pronunciation and perceived the complex relationship between spelling and pronunciation as difficult to cope with while reading aloud.

Other studies have revealed that students are eager to improve their English pronunciation in educational settings. For instance, <u>Burri (2023)</u> conducted a study involving 49 students aged 12 and older from Australia and Japan, and found that most learners wanted opportunities to work on their pronunciation and have their errors corrected. Similarly, <u>Tergujeff (2013)</u> studied 10 Finnish students learning English as a foreign language and discovered that fluency and intelligibility were their primary goals. Some students felt they received insufficient help with pronunciation in classes, while others took the initiative to develop their skills on their own. They improved their pronunciation outside the classroom by listening to English music, watching English TV shows and movies, and playing online games.

Furthermore, <u>Shrestha (2013)</u> explored the experiences of Bangladeshi primary school students regarding teaching practices in English language classrooms. Their study involved conducting a semi-structured group interview with 600 Grade 3 students from various regions of Bangladesh. The results revealed that the students had favorable opinions regarding activities such as reciting, drills, and working with visuals and flashcards. However, they expressed unfavorable views about memorization, the teacher's use of the Bangla language, audio elements—such as songs, rhymes, dialogues, and stories—and instances of teacher mistreatment towards students. Students reported enjoying sentence drilling, singing songs, reciting poems, and repeating words with their teacher.

All in all, students' perception about English learning, particularly regarding pronunciation, must be taken into consideration when teaching these elements. Their insights can provide valuable information for educators and researchers that might otherwise remain inaccessible. Additionally, by considering the perspectives of children, teachers could adapt and improve their teaching strategies to create more engaging and effective learning experiences.

### Method

## **Research Problem**

The study employs a mixed-methods Action Research (AR) design to investigate the benefits of implementing the Color Vowel ® approach to develop decoding skills to primary students in a subsidized school located in Talcahuano, Chile. Fourth-grade students at this school face challenges with reading and decoding vowel combinations. Pronunciation instruction is neglected and only addressed when specific words pose difficulties, leading to a lack of activities and support for improving phonological awareness and decoding skills.

The primary objective of this AR was to explore the contribution of the Color Vowel ® approach on 4<sup>th</sup> graders' vowel decoding skills from print to letter. Specifically, the study aims to: 1) analyze students' vowel decoding skills when using the Color Vowel ® approach, and 2) describe students' perception on the use of the Color Vowel ® approach and influence on their vowel decoding skills.

## **Participants**

This action research was carried out with a convenience sample (<u>Taherdoost, 2016</u>) consisting of 33 students aged 9 to 10, comprising 21 boys and 12 girls. These students receive 5 pedagogical hours (45 minutes each) of EFL lessons per week, with a primary focus on vocabulary and grammar assessment. The 4th-grade class was highly participative, displaying good behavior and typically following the teacher's instructions. In terms of their sociocultural background, their access to English outside school is ample; i.e., some of them had private English lessons, others traveled abroad, they usually watch movies and play video games in English.

Given the age of the participants, the teacher-researcher provided parents and guardians with an information leaflet explaining how the data from the study would be used and assuring them of confidentiality. They were then asked to provide written consent for their children's participation in the research.

# Action Plan

After identifying the problem through observation, the action research intervention commenced. For this purpose, eight sessions were planned, with specific activities and materials designed for their implementation. The first session was focused on two monophthongs /i:/ and /u/ and the second one on two diphthongs /et/ and /au/. The remaining two sessions aimed at the decoding of the four vowel sounds taught in the previous sessions (Figure 5).



Figure 5. Action Research plan

Source: Own authorship

The elements of the Color Vowel<sup>®</sup> approach used to improve decoding in this action research study were narrowed due to specific objectives and time constrains. Thus, this study is considered an approximation to the use of the Color Vowel<sup>®</sup> approach.

The Color Vowel ® approach uses colors to represent different vowel sounds, providing a visual cue for students to associate sounds with specific colors. To facilitate this, the anchor images and phrases (Figure 6) from the Color Vowel® approach were used so that students were able to see and recall the connection between the colors and the corresponding vowel sounds. The anchor images from the Color Vowel® approach related to the four vowels addressed during the intervention were displayed on the classroom walls, allowing students to attach the words practiced in the sessions beneath these images.

Kinesthetic elements, including facial gestures and articulatory postures, were also employed to enhance learning. The Color Vowel® Chart served as an introductory tool, familiarizing students with the approach and highlighting that vowel sounds are produced in different parts of the mouth.

Regarding the implementation of the Color Vowel® approach, it is important to mention that in this study applied the approach in a limited and initial capacity. The Color Vowel® chart was introduced to students as a way of making them aware that vowels are produced in various areas of the mouth.

During the implementation of the action research study, anchor phrases and anchor images were primarily used to facilitate the identification and recall of word pronunciations. Other elements of the Color Vowel® approach, such as the extended arm or open hand indicating stress, were not used, as the focus was on one-syllable words that were not used in phrases or sentences. Therefore, the implementation was limited to a word level.



Figure 6. The Color Vowel ® Approach Colors and Vowel Sounds Association

Source: Blue Canoe App (Color Vowel® Anchor Images, 5<sup>th</sup> Edition © 2019. Used with Creative Commons licensing (<u>CC BY-NC-ND</u>). ColorVowel.com)

This initial approximation to implementing the Color Vowel® approach was guided by the Color Vowel® approach teacher's manual, which provides recommendations for introducing the method to different learners (<u>Taylor & Thompson, 2016</u>). Consequently, the teacher-researcher conducting this action research did not receive formal training in the Color Vowel ® approach and based the intervention on her own understanding of the approach.

# Data Collection Instruments

Four instruments were used to gather data, including a pre-intervention test and a post-intervention test to assess students' pronunciation accuracy, as well as a Likert scale and a focus group to collect information about their perceptions of the Color Vowel ® approach, respectively.

In the initial phase of data collection, a pre-intervention test was administered to evaluate students' pronunciation skills. These tests are classified as non-parametric tests since they were designed for a specific population (4<sup>th</sup> grade), providing relevant and focused feedback on students' performance (<u>Cohen *et al.*</u>, 2017</u>). The instrument used was a checklist featuring a 20 word-list divided into four different vowels (/i:/, /u/, /eɪ/ and /au/). These vowels were selected based on a study by <u>Fashola *et al.*</u> (1996), which examined phonetic and orthographic sources of spelling errors in Spanish-speaking children transitioning to literacy in English. The study revealed how Spanish-speaking children applied phonological and orthographic rules from their native language to English, leading to predictable spelling errors. For instance, the phonetic transformations were observed when words like "baby" were pronounced as "beibi" or "dreaming" as "driming." These examples illustrate the challenges Spanish-speaking children face

when transferring Spanish phonetic representations to English orthographic forms during the literacy transition process. Understanding these phonetic transformations can help educators better support bilingual students in developing their English spelling skills, addressing specific challenges stemming from the differences in phonological and orthographic rules between Spanish and English. The aforementioned checklist consisted of 20 isolated words related to the thematic unit "Food", which was the unit that had to be covered according to the EFL curriculum. Each vowel sound included 5 words for students to read aloud. Students' decoding skills were assessed based on the accuracy of their pronunciation, with correct decoding assessed as "expected" and incorrect as "other". The checklist totaled 20 points, with 1 point awarded for each correctly decoded word.

Children are identified as a special population because they are still developing cognitive, social, and communication skills. Therefore, researchers stress the necessity of designing survey instruments that are suitable for children and take their specific traits into account (Inostroza *et al.* 2024). Accordingly, a Likert scale was designed to collect students' perceptions about the use of the Color Vowel ® approach. This instrument, consisting of 6 items, had three dimensions: students' perceptions of the improvement they felt in their decoding performance after the implementation of the Color Vowel ® approach (1 item), their perceptions of the effectiveness of the Color Vowel ® approach (4 items), and the communication purposes they perceived after the implementation of the approach (1 item).

The focus group followed a semi-structured format, allowing students to avoid off-topic answers, while feeling safe and confident among their peers (Werlinger & Inostroza, 2024). The instrument was designed with the students' age in mind, using clear and simple language, and was conducted in Spanish. Each question gave the opportunity to students to develop their ideas, as they had to explain their answers.

### Data Analysis Technique

Descriptive statistics (Burns, 2010) were employed to analyze and compare the results obtained from the pre- and post-intervention tests. The mean and median were used in order to describe the scores obtained by the learners. Moreover, Shapiro-Wilk test and Wilcoxon signed-rank test were used to assess the normality of the data distribution and to determine the significance of differences observed between the pre- and post-intervention pronunciation accuracy scores, respectively. Additionally, the Likert scale facilitated a frequency analysis of students' answers according to their level of agreement with the Color Vowel ® approach.

For the focus group, a content analysis technique was used. The main objective of this analysis is to uncover and delineate the themes and subthemes that emerge from the students' responses (<u>Given, 2008</u>). By identifying these patterns, the study aims to identify common topics of discussion and ultimately derive meaningful interpretations from the data.

# **Findings and Discussion**

In this section, the data collected from the intervention will be presented in alignment with the discussion and the specific objectives.

## Specific Objective 1: To analyze students' vowel decoding skills when using the Color Vowel ® approach. Pre- and Post-intervention Tests Results

<u>Table 1</u> and <u>Table 2</u> below show the results for the pre- and post-intervention tests. When comparing the two sets of data, it can be observed that there is an increase in both the mean and median scores from the pre-intervention to the post-intervention test, indicating an improvement in performance after the intervention. The standard deviation for the post-intervention test scores is higher than that of the pre-intervention test scores, suggesting a slightly greater variability in the scores after the intervention. The range of scores for both tests also increased, with higher minimum and maximum values for the post-intervention test.

	N	Mean	Median	SD	Minimum	Maximum
Pre-intervention test scores	33	8.21	9	4.26	1	16

 Table 1 . Global Descriptive Pre-Intervention Test Analysis

 Table 2. Global Descriptive Post-Intervention Test Analysis

	N	Mean	Median	SD	Minimum	Maximum
Post-intervention test scores	33	15.1	16	5.14	2	20

These findings are consistent with <u>Al-Tamimi & Rabab'Ah (2007)</u>, who investigated the effect of phonological awareness instruction on word-reading ability among EFL first-graders. Their study concluded that phonological awareness plays a crucial role in developing word-reading ability, emphasizing the importance of explicit phonological awareness instruction.





Source: Own authorship

As a general analysis, the graph above (Figure 6) indicates that the majority of participants showed improvement in their scores on the post-intervention test, with all four vowel sounds demonstrating enhanced performance and accuracy among learners. These findings also align with <u>Ghorbani *et al* (2016)</u> results about the way explicit instruction of vowels, by increasing the awareness and consciousness of learners, can be more effective than implicit teaching methods. Furthermore, the current AR results were also consistent with <u>Underhill (2005)</u>, who emphasized that pronunciation is also a physical activity. He argued that both teachers and students must be aware of how sounds are produced by manipulating or controlling muscles involved in speech production. Therefore, the current findings reinforce the potential benefits of explicit phonological awareness training in improving pronunciation and decoding skills in 4<sup>th</sup> grade students. The Shapiro-Wilk test results (Table 3 below) indicate that the distribution of scores for the pre-intervention test is approximately normal, while the distribution of scores for the post-intervention test significantly deviates from normality. The "W" value of 0.965 suggests that the data from the pre-intervention test closely approximates a normal distribution. As the "W" value approaches 1, the data exhibits a stronger resemblance to normality. In contrast, the "W" value of 0.864 for the post-intervention test indicates a notable departure from a normal distribution, falling significantly below 1 and suggesting that the data in the post-intervention test does not closely conform to a normal distribution.

		Shapiro-Wi	ilk
	N	W	р
Pre-intervention test	33	0.965	0.357
Post-intervention test	33	0.864	<.001

 Table 3. Shapiro-Wilk Test Results

Based on the Shapiro-Wilk test results, conducting a Wilcoxon signed-rank test was deemed appropriate for analyzing the paired pre-intervention and post-intervention test scores, which can be observed in <u>Table 4</u> below.

The p-value being less than 0.001 indicates strong evidence against the null hypothesis. For the pre-intervention test, the p-values of 0.357 exceeds the typical significance level of 0.05. This implies that there is no substantial deviation from a normal distribution in the pre-intervention test data. On the other hand, the p-value for the post-intervention test is less than 0.001, significantly lower than the common significance level of 0.05. This low p-value indicates a significant departure from a normal distribution in the post-intervention test data, suggesting that it does not follow a normal distribution pattern.

Table 4.	Wilcoxon	Signed-	Rank	Rest.	Results

			Statistic	р
Pre-intervention test	Post-intervention test	Wilcoxon W	1.00 <sup>a</sup>	<.001

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

<sup>a</sup> 1 pair(s) of values were tied

Therefore, it can be concluded that there is a significant difference between the pre-intervention and postintervention test scores, with the post-intervention scores being higher. Overall, the results suggest that the intervention positively contributed to the test scores, leading to a significant improvement in students' vowel decoding skills from print to speech when using the Color Vowel ® approach.

# Pre- and Post-intervention Test Results by Vowel

In Figure 7 and Table 5 below, at a glance it can be observed the difference in the mean scores illustrating that the vowel /au/ showed greater improvement in decoding from print to speech. These findings reinforce the potential benefits of the Color Vowel ® approach and explicit phonological awareness training in improving pronunciation and decoding skills in 4<sup>th</sup> grade students.

Figure 8. Pre- and Post-Intervention Test Mean Scores Difference by Vowel



Source: Own authorship

When comparing the difference in the mean of each vowel, the following are obtained:

Vowel		Pre-intervention mean	Post-intervention mean	Difference
/i:/	2.73	4.12	1.39	
/u/	1.52	3.42	1.90	
/eɪ/	2.27	4.03	1.76	
/ <b>a</b> u/	1.42	3.52	2.10	

Table 5. Pre- and Post-Interventions Mean Scores Difference

These findings align with <u>Al-Tamimi and Rabab'Ah (2007)</u>, who explored how phonological awareness influenced the word-reading skills of first-grade EFL students. Their findings indicated that phonological awareness contributes to the enhancement of word-reading proficiency in first-grade students. This underscores the significance of providing explicit instruction in phonological awareness.

# Specific Objective 2. To describe students' perception on the use of the Color Vowel ® approach and influence on their vowel decoding skills.

For this specific objective, a Likert scale and a Focus Group were applied to gather data about students' perceptions. These instruments allowed the teacher-researcher to report students' answers in two ways, with numbers (percentages indicating the frequency of students' answers) and with qualitative descriptions of their responses through content analysis, respectively. In addition, the Likert scale provided an overview of the perceptions of the learners, and the Focus Group facilitated an in-depth analysis of their perspectives. The original data was gathered in Spanish and translated into English for this article in order to make it accessible to an international audience. In the participants' quotes presented here, words in bold were originally spoken in English.

The dimensions that emerged from the Likert Scale and the Focus group together are shown in <u>Figure 9</u> These findings are presented considering 4 dimensions with 6 themes.

Dimension	Theme
Improvement in EFL	Performance in the lesson
	Pronunciation
Effectiveness of the Color Vowel ® approach	The use of colors as a medium to recall vowel sounds
	Enjoyment of the Color Vowel ® approach
Communication purpose	Future lives
Difficulties when decoding	Discriminating spelling and vowel sounds

#### Figure 9. Focus Group dimensions and themes

#### Source: Own authorship

# Dimension 1: Improvement in EFL

This dimension was about how students expressed the improvements they perceived after the Color Vowel ® approach was implemented.

Dimension 1 consists of one question from the Likert scale "I feel more comfortable speaking English when using the Color Vowel ® approach" and the answers collected from the Focus Group.

As observed in Figure 10, 88% of students agree with the statement "I feel more confident when speaking". This may be attributed to the fact that when students are knowledgeable and aware of how to decode vowel sounds, they are more certain about how to pronounce different words, hence feeling more confident when speaking.



Figure 10. Likert Scale Response for Dimension 1

Source: Own authorship

Furthermore, one theme that emerged from the Focus Group responses was the improvement the students perceived in EFL classes. This was expressed in quotes such as the following:

**Student N° 1:** "Before, English was difficult for me, and now it's not so much" **Student N° 3:** "Before, English was challenging for me, and now it's not so hard" Another theme that emerged was the improvement they perceived regarding their pronunciation. They expressed:

**Student N° 15:** "The strategy helped me, and I think it helped everyone to pronounce 'au' and not 'au' because it was difficult for many of them"

**Student Nº 18:** "The strategy has helped me a lot. For example, **'cow'** has a part with 'au', and I used to say **'cow'** with 'au'"

Student N° 19: "The strategy helped me because the colors and sounds helped me a lot because when I was a child, I used to get confused a lot. For example, the word 'moon'—I used to say it with 'o'"

The responses from the Focus group reveal that students had positive perception of the improvement of their own pronunciations and decoding skills. The majority of them expressed feeling an improvement after the intervention took place.

Overall, students' positive perceptions regarding the improvement of their pronunciation and decoding skills and their confidence when speaking, indicate a positive effect that the Color Vowel ® approach had on students' perception about its use.

These findings are consistent with those in Ghorbani *et al.*'s study (2016), with suggest that providing explicit instruction on vowel sounds, either by raising learners' awareness or consciousness, proves more successful than the implicit method of teaching vowels through an intuitive-imitative approach. Moreover, teachers can enhance their students' proficiency in vowel sounds by heightening their awareness, allowing them to develop a solid foundation and acquire the necessary skills for effective communication.

# Dimension 2: Effectiveness of the Color Vowel ® approach

This dimension expressed the effectiveness that students perceived after the Color Vowel ® approach was implemented. Dimension 2 consists of four statements from the Likert scale: "The strategy helps me to remember the vowel sounds", "the strategy helped me identify vowel sounds", "I enjoy learning the sounds of English", and "Activities are fun". These statements are presented in two parts: the first two statements represent the dimension "the use of colors as a medium to recall vowel sounds", while the latter two represent the dimension "enjoyment of the Color Vowel ® approach".

In Figure 11, 91% and 81% of students think that the Color Vowel ® approach helps them to remember and identify vowel sounds, respectively.





These results were directly linked to the students' responses from the Focus Group, expressed in quotes such as the following:

Student Nº 8: "The colors helped me memorize words"

Student Nº 17: "I could immediately know how to pronounce the words"

Student Nº 25: "When they put the colors, I knew what letter I was going to pronounce"

Student N° 26: "For me, when they put the colors on the board, it was easy to pronounce the words like 'green', 'beans'"

These responses revealed that students perceived the implementation of the Color Vowel ® approach as effective. They recognized the link between the color-coded words and their pronunciation.

A second theme that emerged from students' responses was the enjoyment students felt of the Color Vowel ® approach. In Figure 12, 84% of the students agree that they enjoyed learning the sounds of English using the Color Vowel ® approach, and 91% found the activities to be fun.



Figure 12. Likert Scale Responses for Dimension 2



The results from the Likert scale align with students' responses from the Focus Group. The following quotes illustrate this point:

Student Nº 22: "I thought it was fun, and it is easier with the colors to distinguish the letters."

Student Nº 17: "It is fun because I could immediately know how to pronounce the words."

Student N° 2: "Fun, it helped me improve the pronunciation of words like blueberry, brownie, cow, milk, and others."

Student Nº 18: "It is more entertaining, and easier; it has helped me a lot."

Student Nº 29: "fun and it helped me, so it was cool and fun."

These responses indicate that students enjoyed and were entertained by the Color Vowel ® approach and the activities conducted during its implementation. Furthermore, it seems that students associated the enjoyment of the activities with the helpfulness and improvement in their decoding skills. This suggests that when students perceive an activity or strategy as fun or enjoyable, they seem to improve their results or skills in a particular area, although this idea is preliminary and needs further research. Additionally, the students' statements resonate with what <u>Odisho</u> (2007) proposes through the Multisensory, Multicognitive Approach (MMA). Odisho emphasizes the importance of using multiple sensory modalities and cognitive processes in language learning. This approach involves engaging

learners through auditory, visual, and tactile-kinesthetic sensory modalities, encouraging them to attentively listen to sounds, retain an acoustic and auditory image of them, and compare and contrast them with sounds already in their psycholinguistic inventory. MMA also suggests that visual aids such as colors, pictures, and facial gestures are used to highlight the differences between sounds and to help learners visually monitor lip configurations and articulatory postures.

These results align with <u>Shrestha (2013)</u> findings, which examined teaching practices in the EFL classroom, considering children's perceptions about them. The findings indicated that students had positive attitudes towards practices like recitation, drills, and using visual aids and flashcards. Most students expressed they enjoyed playing games during English lessons because they are fun and spontaneous. They also enjoyed using posters and pictures in class, which were perceived as helpful by these young learners.

Overall, the evaluation of the Color Vowel (B) approach's effectiveness and likability reflects a favorable and significant response from students. Their explicit connection between color-coded words and decoding demonstrates a solid understanding of the strategy's efficacy. The observed relationship between enjoyment and learning outcomes in these results are encouraging. In essence, the positive responses from students, reinforced by quantitative evidence from Likert scale responses and qualitative insights from the Focus Group, highlights that the Color Vowel (B) approach was successful in improving learners' vowel decoding skills.

All in all, the elements students enjoyed the most during the implementation of this action research were the visual aspect of color-coded words, as it helped them make explicit connections between colors and vowel sounds. The kinesthetic component of this approach was also enjoyed by young learners, when they expressed the differences in pronunciation (manner and place of articulation, specifically) of previous unknown words for them.

# **Dimension 3: Communication Purposes**

This dimension captures students' responses regarding the communication purposes they perceive from the implementation of the Color Vowel ® approach, particularly in relation to their future lives.

Students' answers from the Likert scale support these ideas of improving their decoding skills for communication purposes. Figure 13 shows that 94% of students agree that using the Color Vowel ® approach will help them speak better in the future.



Figure 13. Likert Scale Response for Dimension 3

To go more in depth, students' responses from the Focus Group further support and explain such perceptions:

**Student N° 28:** "The strategy helped us pronounce words so that when we grow up, we will be better at speaking English, in case we get a job or if you are in a foreign soccer club"

**Student N° 27:** "I would like to continue using the strategy because if I want to travel to the USA, it can help me communicate with people in there. For example, to know the words they say because if I go and I don't know any English I won't understand what they say, for example, they say "come to my house" and I don't understand and I won't know how to respond."

**Student N° 10:** "I liked using the strategy because in December I will have a relative coming from Canada and they will speak to me in English, and I could understand them, and I could talk to them."

Student N° 22: "I would like to know more pronunciations so that I can travel to other countries and not find it difficult to speak English."

These answers reveal that students recognized the importance that English has in their future lives. They reflect on how mastering decoding and pronunciation can enhance their communication skills, whether it be in social contexts (family living abroad), cultural exchange (travel), or future jobs (football club).

These results go in line with <u>Tergujeff (2013)</u> and <u>Burri (2023)</u>, whose studies emphasize the importance of communication in EFL classes and their desire for pronunciation instruction, where the ultimate goal is to achieve effective communication, fluency, and clarity in their language skills. This suggests that children have a say in regards to learning English and how it can be connected to their future lives in very practical and specific ways. For instance, they expressed the desire to continue learning about decoding and pronunciation to better communicate, while traveling abroad, understand family members living overseas, and engage with other English speakers.

Overall, students' responses in the third dimension reveal that learners acknowledge the importance of English proficiency in their future lives. They recognize the practical implications of language learning, emphasizing the significance of accurate decoding and pronunciation for effective communication in diverse contexts, including familial interactions, cultural exchanges during travel, and potential future job opportunities. The findings highlight a comprehensive and integrated perception on language development, with a focus on real-world communication.

#### Dimension 4: Difficulties When Decoding

This dimension considers the difficulties perceived in differentiating between spelling and vowel sounds. This was expressed in quotes such as the following:

**Student N°24:** "Some pronunciations of some words were difficult because I didn't know what color they were. Like my classmate, I got confused with "**sweet**" and "**stew**;" it was difficult for me.

**Teacher:** "Why did you find them difficult?"

Student Nº 24: Because they had the same letters but in a different order."

These answers revealed that the student experienced confusion and struggled distinguishing certain words based on their pronunciation and spelling patterns. The specific examples of "sweet" and "stew" were cited by Students 14 and 24, indicating a challenge in recognizing and associating the correct decoding of those words. These insights emphasize the importance of incorporating additional strategies to avoid confusion in the development of their decoding skills.

According to <u>Modesti's (2016)</u> study, some students reported discomfort when speaking English, which they attributed to the perceived difficulty of pronunciation and the relationship between spelling and pronunciation. These results are consistent with 4th graders in the focus group responses. As mentioned above, students mentioned some difficulties regarding the decoding of words that had similar spelling (as in "stew" and "sweet"). This discomfort may be due to students not being explicitly trained in uttering vowel sounds or pronunciation.

In conclusion, considering the 4 dimensions that emerged from students' responses, it can be observed that students have their own perceptions and opinions about English. These findings resonate with <u>Pinter (2014)</u> and <u>Kucha and Pinter (2012)</u>, who underscore the importance of recognizing children as active participants in the research and institutions that shape their lives. In studies involving children, it is essential to be attentive to their emotions, interests, and perspectives in various aspects that directly affect their lives.

# Conclusions

Overall, the results of the present action research were particularly positive, showing progress towards the overall objective which was analyzing students decoding skills of vowels /i:/, /u/, /eɪ/ and /au/. Students demonstrated an improvement in their decoding skills when using the Color Vowel ® approach. In addition, their phonological awareness improved, especially regarding the articulation of previously unknown sounds and the recognition of different word patterns, such as in the case of the diphthong /au/. These findings align with Al-Tamimi and Rabab'Ah (2007), who emphasized the impact of phonological awareness on word-reading skills, as well as Ghorbani *et al.* (2016), who showed that explicit vowel instruction is more effective than implicit methods. This positive result aligns well with the principles of phonological awareness and multisensory and multicognitive learning, as described by Odisho (2007), employs various sensory modalities to enhance pronunciation skills. Odisho's sequence for teaching vowels (cognitive, auditory, visual, and tactile-kinesthetic orientations) helps learners address pronunciation issues. Using multiple senses, students developed an awareness of the location and articulation of different vowels and associating the color-coded words from the Color Vowel ® approach, helping them to improve their decoding skills.

Additionally, the positive results were supported by student perceptions, as evidenced by the Likert scale results (with an average of 88% agreement across all assessed statements) and favorable responses in the focus group discussion (favorable answers regarding the strategy Color Vowel ® approach). Students attributed their progress to a number of factors, including the use of colors, classroom activities, and the use of the multisensory and multicognitive approach. The use of colors not only makes the learning experience more engaging but also helps children gain a deeper understanding of the decoding process. Students were particularly drawn to the multisensory and multicognitive elements of the Color Vowel ® approach, enhancing their overall learning experience. These results are consistent with <u>Shrestha (2013)</u>, who found that students in EFL classrooms enjoyed and benefited from multisensory activities like visual aids, games, and drills. Thus, the current study adds to the growing body of research that indicates that children enjoy and engage in multisensory activities, allowing them to better comprehend their own language learning process. This has clear implications for the development of pedagogies that respond to the local needs as well as early language learners' needs.

Although the overall results were positive, several limitations should be considered when analyzing the results. For instance, factors such as socio-economic background, parents' level of studies, aspirations or others, may influence the outcomes. This particular class is usually involved and engaged in the lessons, and parents are often very present and interested in their learning process. In this regard, <u>Butler and Le's (2018)</u> study revealed a positive correlation between students' English performance and both parental income and educational level. Additionally, the study identified parental beliefs about their child's ability to succeed in English learning as the strongest predictor of their child's English performance. Furthermore, the sample size can also be a factor to consider. This action research involved a convenience sample of 33 students, which limits the ability to extrapolate the results to other contexts, due to the small sample size and particularities of the context. Moreover, the intervention took eight sessions with a limited version of the Color Vowel ® approach. This may be limited to ensure the long-term contribution of this study. Nonetheless, these limitations may be presented as a possibility of expanding research in this field.

Further research studies could be carried out to explore the interactions of these elements (socio-economic factors, number of students in the classroom) within a wider and more varied range of educational environments and conditions. By conducting wider research studies across various contexts, researchers can gain a deeper understanding of the nuances of these educational dynamics, and shed light on how they manifest in different circumstances, especially in EFL learning in the Latin American and Chilean context. Moreover, further research

focusing on the specific requirements and challenges that children encounter while learning EFL is needed, especially in these regions. This emphasis on local contexts and student needs can inform more targeted and effective educational practices, eventually benefiting a wider range of learners and contributing to the enhancement of EFL education in these regions.

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# Appendices

# Checklist: Pre-intervention test

Vowel sound	Word	Expected	Other
/i:/	Beet		
	Beans		
	Peach		
	Cream		
	Sweet		
/u/	Soup		
	Juice		
	Blueberry		
	Fruit		
	Stew		
/eɪ/	Cake		
	Grapes		
	Steak		
	Pancake		
	Grapefruit		
/aʊ/	Brownie		
	Cloud bread		
	cow milk		
	sour		
	flour		
Score	/20		

# **Checklist:** Post-intervention test

Word	Expected	Other
Beet		
Brownie		
Peach		
Stew		
Grapes		
Flour		
Sweet		
Blueberry		
Steak		
Sour		
Cake		
Juice		
Cow milk		
Cream		
Grapefruit		
Beans		
Cloud bread		
Fruit		
Pancake		
Soup		
Score:/20		

# Likert Scale

		De acuerdo	No sé	En desacuerdo
Comunicación como finalidad	Creo que el enfoque Color Vowel® me ayudará a hablar mejor en inglés.			
Rendimiento en la habilidad de decodificación	Me siento más confiado al hablar inglés cuando uso el Color Vowel® approach.			
Efectividad de la estrategia	Disfruto aprender sobre los sonidos del inglés cuando uso el enfoque Color Vowel®.			
Efectividad de la estrategia	Creo que las actividades de Color Vowel® son divertidas			
Efectividad de la estrategia	El enfoque Color Vowel® me ayuda a recordar los sonidos del inglés.			
Efectividad de la estrategia	El enfoque Color Vowel® me ayuda a identificar mejor los sonidos del inglés.			

# **Focus Group**

Questions
1 ¿Te ha ayudado el enfoque Color Vowel ® a mejorar tu pronunciación en inglés? ¿Cómo lo notas?
2 ¿Qué te pareció usar el enfoque Color Vowel? Explica.
3 ¿Qué fue lo más fácil durante estas clases?¿Por qué?
4 ¿Qué fue lo más difícil? ¿Por qué?
5 ¿Te gustaría seguir usando esta estrategia? ¿Por qué?

