*Original Research Article*

Investigating the Effectiveness of the Color Vowel Approach in Enhancing ESL Learners’ Pronunciation Skills

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ABSTRACT

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| This study aimed to investigate the effectiveness of the Color Vowel Approach in improving pronunciation among ESL learners. Specifically, it sought to determine whether significant differences existed between the pretest and posttest results of the control and experimental groups, and to evaluate the progression of pronunciation skills through formative assessments. This quasi-experimental study, which employed a pretest-posttest non-equivalent control group design, was conducted at the University of Eastern Philippines, during the first semester of the academic year 2018–2019. A total of 59 students enrolled in Speech 111 were selected using matched-group sampling and assigned to either the control group (n=29) or the experimental group (n=30). The experimental group received pronunciation instruction using the Color Vowel Approach, while the control group followed conventional teaching methods. Data collection involved researcher-made pretests and posttests (oral and written), weekly formative assessments, classroom observations, learning logs, and student journals. Seven sessions of formative testing were conducted before and during the intervention. Pretest results showed both groups performed below average, indicating limited initial pronunciation skills. Posttest scores showed statistically significant improvement in both groups (P = .04 for control; P = .001 for experimental), with the experimental group achieving significantly higher gains than the control group (P = .001). Formative assessments showed consistent improvement: the experimental group advanced from a superior to a very good rating, while the control group improved from good to highly satisfactory. Overall, the experimental group attained a combined rating of very good, compared to a good rating for the control group. The Color Vowel Approach was found to be an effective strategy for enhancing ESL learners’ pronunciation skills, particularly in vowel articulation and word stress at the word, phrase, and sentence levels. These findings support the development of communicative instructional programs that integrate the Color Vowel Approach to better address the needs of language learners. |

*Keywords: Color Vowel Approach, pronunciation instruction, ESL learners, phonemic awareness, vowel articulation, communicative language teaching*

1. INTRODUCTION

**Background of the Study**

Traditionally, teaching pronunciation has always incorporated drills, recital, and repetition of words, phrases or sentences. In most schools, the Vietor triangle of Wilhelm Vietor and the International Phonetic Alphabet (IPA) serve as common tools in teaching pronunciation among students. From their use, it was observed that students show inhibition and low or uneven participation because of its technicalities. There are a number of frustrations that both teachers and students meet in teaching the sounds of English. These include rules that are taught for producing the sounds of words. However, there are so many exceptions that they do not almost seem like rules. For instance, “mow” cannot be pronounced like in the word “cow” and sometimes “read” as “red.” These exceptions to the rules can be very overwhelming and confusing among ESL learners. This is the problem that the researcher would like to tackle- providing an instructional package or tool to easily understand and learn the sounds of English.

Each language has its own unique set of meaningful sounds or phonemes. While most languages have five to eight vowel sounds, American English has approximately 14 to 15 vowel sounds depending on one’s national, regional, and cultural background (Nilsen and Nilsen, 1972). Meanwhile, the English alphabet has five vowels. These vowels represent about fifteen vowel sounds. Each letter or combination of letters interplay to represent multiple vowel sounds. In short, the nature of English spelling makes it difficult for a learner to determine how written words are to be spoken. By definition, consonant sounds involve some form of obstruction in the vocal tract; that is, the air stream is interrupted or impeded by the lips or tongue (Friedl, 1979). Because they are more easily felt, consonants are more easily learned. Conversely, the fact that vowel sounds are harder to pinpoint makes them even more difficult to learn. Recently, a holistic approach to learning has found a number of proponents including pronunciation educators, who affirm that L2 pronunciation training should involve the whole learner, not just the speech apparatus or learners' cognitive faculties (Larsen-Freeman, 2000). In addition, an important factor in learning vocabulary is focusing on intelligible pronunciation. Gilbert states that English language learners tend to ignore stress when they learn vocabulary and failure to learn the stress of new words often leads to an inability to recognize those words in spoken form (Gilbert, 2008).

The Color Vowel Approach is a powerful response to the challenges posed by these problems. The Color Vowel Chart, the main instructional aid in this approach developed by Taylor and Thompson, connects the vowel sounds of English to key words and phrases through basic colors and provides a shorthand for teachers and learners to talk about pronunciation with ease. For instance, using the International Phonetic Alphabet (IPA), /i/ is represented by the color green, silver for /I/, gray for /e/, red for /ɛ/, black for /æ/, blue for /u/, wooden color for /ʊ/, rose for /o/, auburn for /ɔ/, olive for /a/, purple for stressed /ɝ/ and unstressed /ɚ/, and mustard for stressed /ʌ/. It has also equivalent colors for diphthongs like white for /aɪ/, turquoise for /ɔɪ/, and brown for /aʊ/. It is a multi-modal way of teaching sounds of English that connects its spoken and written forms with unprecedented clarity and has profound implications for vocabulary development, reading readiness, and spelling instruction (Taylor and Thompson, 2016). In terms of spelling, one of the other benefits of using the Color Vowel Approach is that when students use the graphic organizer and write down words according to their “color,” they often start to see the spelling patterns for making different sounds. This is why it is recommended that teachers have students underline the letters that make the sound or sounds in that category. For example, under RED DRESS students might have the words guess, best, friend, read (past tense), and others. From there, the students are introduced and familiarized with the different ways of making “red” words. This approach further promotes kinesthetic learning as it utilizes rubber bands and open hand gestures to stretch or show the stressed syllable of a word. This tool can be introduced to students even at the lowest levels and used to focus learners’ attention on the stressed vowel sounds in new words, thus helping them hear the stress that establishes the rhythmical patterns of spoken English. Students are introduced not only to the sounds but also to the positions of the sounds because the chart’s shape represents the mouths to show the sounds in relation to whether the sound is pronounced in the front, central part, or back of the mouth and whether the jaw is high or low.

Using the IPA to teach pronunciation makes students, who are already second language learners, memorize yet another alphabet. Instead of helping students, the IPA sometimes makes them more confused about how to pronounce words, and takes the focus off pronunciation and more on transcription. The Color Vowel Chart minimizes this confusion by removing this extra alphabet and instead providing the ESL learners with something visual and easy to associate sounds with. In light of this, the present study aimed to determine the effectiveness of the Color Vowel Approach in improving students’ pronunciation skills, particularly their ability to articulate and recognize stressed vowel sounds, by comparing the performance of students taught using this method against those taught through traditional instruction.

**Research Questions**

This study generally sought to investigate the effectiveness of the Color Vowel Approach in teaching pronunciation in two selected Speech 111 classes at the College of Science, University of Eastern Philippines. Specifically, it sought to answer the following questions:

1. What are the pretest and posttest results of the control and experimental groups?
2. Is there a significant difference between the pretest results of the control and experimental groups?
3. Is there a significant difference between the posttest results of the control and experimental groups?
4. Is there a significant difference between the pretest and posttest results in the control and the experimental groups?
5. How do the assessment results compare on a per session basis between the control and experimental groups?

**Research Hypotheses**

The study statistically tested the following hypotheses:

1. There is nosignificant difference in the pretest results of the experimental and the control groups.
2. There is no significant difference in the posttest results of the experimental and the control groups.
3. There is no significant difference in the pretest and posttest results of the experimental groups.
4. There is no significant difference in the pretest and posttest results of the control groups.

**Scope and Limitation of the Study**

The study recognized a number of limitations relative to the selection of subjects and conduct of the experiment. First was the unavailability of two intact classes in Speech and Oral Communication enrolled in the University. Consequently, this study was limited to two Speech classes enrolled in the College of Science of the University. The experimental group was composed of 30 BS Biology students, while the control group was composed of 29 BS Environmental Science and BS Marine Biology students. The two Speech classes were scheduled on the same day particularly 1:00-2:30 pm for the experimental group and 4:00 to 5:30 pm for the control group. The time schedules were considered a limitation for the students had prior classes. Specifically, request to arrange the classes in a consecutive time schedule from the Center for Computer Studies (CCS) in the University was not granted due to conflict of classes of students. The study was conducted in the second semester of school year 2018 to 2019 for nine (9) weeks; four (4) weeks before the intervention, another four (4) weeks during the experiment, and one (1) for the midterm examination week.

Moreover, the study recognized a number of factors related to the teaching of pronunciation that surfaced during its conduct. These included the individual differences of the students, mother tongue dominance, physical speech defects, and color blindness. Such factors were not included in measuring the effectiveness of the said intervention. The study also considered the variants of vowel sounds as limitation, for there are a number of vowel sounds that are not pronounced the way they appear in their spelling. These variants were not addressed in the Color Vowel Chart, the main instructional tool in the experimental group, but were given emphasis in the introduction of the sounds of English. Also, the CVC utilized some colors like auburn, rose, mustard, turquoise, and olive that are foreign or unfamiliar to the culture of the students. This was considered as limitation because the students found it hard to understand and connect them to equivalent colors in Philippine context. This was evident when the CVC was introduced during the experimental sessions. Further, this study only incorporated stress as a scaffold to teach pronunciation. It did not include a complete thorough lesson on stress at the phrase and sentence levels, for there are complex rules on understanding this concept. Activities in teaching stress such as the use of rubber bands and hand gestures were incorporated in teaching the vowel sounds of English. Although yoga exercises are reflected in the application of the Color Vowel Approach particularly in teaching stress, this was not included as part of the activities in the said intervention.

During the conduct of the study, a number of challenges also surfaced. First was the incomplete attendance of the students during the sessions, thus resulting in non-participation in the formative test on a per session basis. Second was the unavoidable coincidence of local and national non-working holidays. As a result, there was cancellation of classes. In instances in which only one class was affected by the cancellation, the researcher opted to cancel the other class so that lessons would still be parallel. Make-up classes were also held on consecutive schedules. Lastly, the study also considered as a limitation the scarcity of literature and studies in the local and national contexts concerning the specific utilization of the Color Vowel Approach or the Vietor Triangle in teaching and enhancing the pronunciation skills of the students. This was manifested in the researcher’s active involvement in rehashing literature and studies in the Internet, Open Access Libraries such as Science Direct, which is popular for up-to-date literature reviews, e-libraries, and even the National Library of the country.

Figure 1. Schematic diagram showing the conceptualization of the study

Figure 1 presents the schematic diagram illustrating the conceptual framework of the study, which follows a quasi-experimental design involving two groups: a control group and an experimental group. Both groups underwent a pretest to assess their baseline pronunciation skills. The control group received instruction using the prototype or traditional teaching strategy, while the experimental group was exposed to the Color Vowel Approach (CVA) as the intervention, indicated by "X" in the diagram. After the intervention, both groups took a posttest to measure improvements. The results of the pretests and posttests were compared within and between groups to determine whether the CVA led to significantly greater improvements in pronunciation skills, particularly in the recognition and production of stressed vowel sounds, than the traditional teaching method.

**Literature Review**

*Pronunciation*

There is a range of competencies teachers are expected to teach in English language instruction. This includes grammar, vocabulary, speaking, listening, reading, and writing. Among these, pronunciation is often deprioritized, as many teachers perceive a lack of instructional time and recognize that it is not commonly assessed in standardized exams. However, this contradicts the underlying principle of language teaching that phonemic awareness, a skill developed in teaching and learning pronunciation, is a crucial determinant of success in the reading attainment of alphabet language (Bloomfield, 1938).

Pronunciation is widely regarded as one of the most challenging skills to master in second language acquisition. Learners must devote substantial time to improve their intelligibility in oral communication. Depending on where teachers teach, many or all the students will need to speak and understand English in real life to communicate with both native speakers of English and speakers of other languages. Even with strong grammar and vocabulary, poor pronunciation can impede understanding, rendering communication ineffective. Conversely, learners with clear pronunciation are more likely to be understood, even if they make grammatical mistakes (Rogerson & Gilbert, 1990).

Importantly, the goal of pronunciation instruction is not native-like accuracy, but intelligibility.If learners want to change the way of pronouncing English words, they must change the way they think about the sounds of those words to achieve comprehensible speech. Stress placement, particularly syllable stress, is essential to achieving intelligibility. For example, Darcy (2018) emphasizes that effective pronunciation instruction must be both explicit. Similarly, Walker (2021) advocates for pronunciation teaching approaches that prioritize intelligibility over native-like accuracy, especially within English as a Lingua Franca (ELF) contexts.

Moreover, the increasing emphasis on intelligibility in Global Englishes (Jenkins, 2015) reinforces the pedagogical value of pronunciation models. Jenkins' work challenges traditional standards of pronunciation in favor of mutual understanding among diverse speakers, a view echoed in current TESOL frameworks. Empirical studies have also supported the effectiveness of visual and high-variability input in pronunciation instruction. Thomson (2018) discusses High Variability Phonetic Training (HVPT) as a method for improving learners’ perception and production of L2 vowel contrasts.

According to Ur (2009), incorrect pronunciation can lead to miscommunication, whereas accurate pronunciation fosters listener engagement. Stress and pitch patterns aid learners in mastering vowel and consonant production, and can contribute significantly to overall speaking proficiency. Although pronunciation is sometimes downplayed in assessment rubrics, it plays a key role in communicative competence (Walker, 2021). Likewise, research by Mamhot et. al (2009) shows that ESL learners experience moderate anxiety due to fear of negative evaluation and concerns about how their English impacts daily functioning. This means that ESL students worry about how others perceive them and how English affects their daily activities. Due to this, ESL students suffer from low self-perception, which results in a negative effect on the output process of language learning and performance. Aquino et al. (2015) also found that lack of confidence, fear of making mistakes, disengaged instruction, and limited resources demotivate learners and can further impede language development.

Fraser (2000) contends that the issue is not the importance of pronunciation instruction which is widely recognized, but how it is taught. Teachers must be equipped with the tools, strategies, and knowledge necessary to address pronunciation effectively. Although many problems arise in improper pronunciation, there are many solutions and strategies that can be applied to solve these problems. Teachers have the responsibility to help the students develop their pronunciation skills. Similarly, Abercrombie (1991) asserts learners cannot learn proper pronunciation without the teacher’s instruction and require sustained practice over time to achieve meaningful improvement. improvement of English pronunciation is a continuous process, and it takes time. The teacher must spend more time to help her learners to understand more about the differences between their own pronunciation skills and make more use of the understandable models.

The pedagogy of pronunciation instruction has shifted significantly in recent decades. Traditionally, the focus in pronunciation teaching was almost entirely on producing individual sounds and words correctly; not much attention was given to features such as intonation and rhythm. However, teachers and researchers have begun to realize the importance of these “musical” aspects of pronunciation and to emphasize them more strongly in teaching (Celce-Murcia, et.al., 2010). Ladefoged and Halle (1988) claim that teaching individual sounds is not so important, and intonation, stress, prominence, and rhythm should take precedence in instruction. Nevertheless, no single aspect of pronunciation, segmental or suprasegmental, should be taught in isolation. The pendulum of teaching trends might keep swinging, but it does not need to stop language teachers from utilizing communicative strategies and isolate themselves with just one activity. A balanced approach that integrates both is most effective. Teachers must avoid rigid adherence to a single method and instead employ communicative, integrative strategies tailored to learner needs.

Pronunciation learning requires both cognitive and motor skills. Learners must develop new muscle memory in the articulatory system, akin to learning to dance or play a musical instrument. This process is gradual and requires repeated practice to build fluency (Derwing & Rossiter, 2002). Moreover, Celce-Murcia et al. (2010) outline several knowledge areas essential for pronunciation instruction. Teachers must understand articulatory mechanics, stress, rhythm, connected speech, and intonation. They should anticipate learner difficulties and adapt instruction accordingly. In addition to content knowledge, principles of effective pronunciation instruction include moving beyond "repeat after me" to incorporate multisensory learning strategies, keeping lessons practical and level-appropriate rather than overly theoretical, integrating communicative practice to foster real-life application, and encouraging learner autonomy by developing skills in self-monitoring and independent practice.

In sum, effective pronunciation instruction requires a multifaceted and learner-centered approach. Teachers must be prepared to address both the technical and affective needs of students while integrating pronunciation meaningfully into the broader language curriculum.

*Color Vowel Approach*

To concretize current guidelines for pronunciation instruction, several empirical studies have evaluated various methodologies, one of which is the Color Vowel Approach (CVA). Developed in 1999 by Karen Taylor at the University of Maryland, College Park and later co-developed with Shirley Thompson at George Washington University, the Color Vowel Chart (CVC) was originally conceived as a simple instructional tool. It enabled international students to visualize, practice, and produce word stress without relying on phonetic symbols. In its expanded form, the Color Vowel Approach has been applied not only in pronunciation instruction but also to vocabulary, reading, and spelling instruction, supporting multimodal language development (Taylor & Thompson, 2016). Over time, the CVC has gained wide recognition and is now used by teachers, speech therapists, pronunciation/accent trainers, reading specialists and other language-based professionals across the United States and around the world.

In 2003, through collaboration with Dr. Robin Barr, Linguist in Residence at American University, the chart was further refined to become a visual representation of English sounds that is both pedagogically accessible and phonologically comprehensive. Often referred to as a “simple-deep” tool, the CVC balances ease of use with theoretical depth and requires no complex technology and remaining effective even in low-resource settings. The chart has since evolved into a multimodal instructional approach that connects its spoken and written forms with unprecedented clarity and has profound implications for vocabulary development, reading readiness, and spelling instruction (Taylor and Thompson, 2016). It provides educators with a visual and intuitive framework for teaching pronunciation across subject areas. Each vowel sound is represented by a color-object pair (e.g., green tea, blue moon), helping learners associate sounds with memorable visual cues. As a powerful visual tool, the Color Vowel Chart allows learners to focus on stress and rhythm and identify the vowel sounds of spoken English. The chart also gives teachers a common frame of reference for talking about vowel sounds without having to use phonemic symbols. It allows for integration into daily instruction without the need for separate pronunciation drills. Teachers can simply ask, “What color is it?” when introducing new vocabulary, prompting students to apply pronunciation strategies in real time. This ongoing integration supports incremental phonemic awareness, which, as supported by Thomson (2018) and Darcy (2018), is crucial for long-term development of L2 speech intelligibility.

Additional features such as kinesthetic techniques (e.g., rubber bands, open-hand gestures, and Color Vowel Yoga) support multisensory engagement. The approach promotes incorporation of pronunciation across the curriculum, including subjects like mathematics and science, not just English language classes. For instance, one instructor from Miami University asked her Business English student to bring in ten workplace-relevant terms that she found difficult to pronounce. After classifying and practicing these terms using the CVC, the student reported improved confidence and accuracy when communicating with clients—demonstrating the tool’s practicality and relevance to real-world language use.

Institutional adoption further validates the CVA’s effectiveness. The U.S. Department of State’s Office of English Language Programs distributes the chart to educators worldwide, and Peace Corps TEFL volunteers receive training in its application. It is implemented across K–12 districts (e.g., Aurora, Boise, Clark County), adult education programs (e.g., Arlington Education and Employment Program, Anne Arundel Community College), and numerous universities, including American University, UCLA, Brigham Young University–Hawaii, and the University of Miami. Its international use in language schools underscores its adaptability and perceived value in enhancing phonemic awareness, communicative competence, and learner confidence.

Research supports these outcomes. A study by Taylor, Thompson, and Barr at American University demonstrated a significant increase in phonemic awareness among ESL learners after using the CVA (Murphy, 2017). This was evident in improved performance during communicative tasks. Similarly, Syaifullah et al. (2022) conducted a qualitative literature-based study investigating how the Color Vowel Chart can be implemented in teaching speaking. Their findings confirm that the use of the chart contributes significantly to learners’ improvement in multiple dimensions of oral communication, particularly pronunciation, vocabulary usage, and learner confidence. In addition, Putri and Adawiah (2024) investigated how the CVA supports students’ preferred learning styles in a Pronunciation Practice course at the Islamic State University Datokarama Palu. Their qualitative findings revealed a significant correlation between the use of the Color Vowel Approach and improved student performance, particularly due to the relaxed and multimodal learning environment it fostered. Moreover, the CVA’s student-centered design echoes Jenkins’ (2015) perspective on Global Englishes, which prioritizes mutual comprehensibility and learner empowerment over rigid adherence to native norms. Together, these studies position the Color Vowel Approach as a pedagogically sound and research-supported model that aligns with current priorities in pronunciation instruction and applied linguistics.

Overall, the Color Vowel Approach represents a research-informed, multimodal, and learner-centered framework that aligns with contemporary trends in pronunciation instruction. Its emphasis on intelligibility, visual scaffolding, and communicative integration positions it as a valuable tool in both traditional and ELF-oriented classrooms.

*The Vietor Triangle*

Vowel systems in most languages can be represented visually through vowel diagrams, which typically adopt a triangular format. In these diagrams, vertical position denotes the vowel closeness, with close vowels at the top, and horizontal position for the vowel backness, with front vowels at the left. Unlike consonants, vowel characteristics do not rely on distinctions in voicing, manner, or place of articulation. One particular vowel diagram of note is the Vietor Triangle, also known as the Vowel Triangle, developed by German philologist and phonetician Wilhelm Vietor (1850–1918). The Vietor Triangle schematically represents the relationship between jaw movement and tongue placement during vowel production, drawing from principles of articulatory phonetics (Howatt, 1984).

Created to assist in the pronunciation instruction of second language learners, the Vietor Triangle utilizes symbols from the International Phonetic Alphabet (IPA) to map out twelve English vowel sounds. It differs from more complex quadrilateral vowel charts, which typically include a wider array of monophthongs, diphthongs, and nuanced sound categories. By limiting its scope, the triangle simplifies the representation of English vowels, making it more accessible for instructional purposes.

The International Phonetic Alphabet (IPA), a system that ensures a one-to-one correspondence between phonetic symbols and sounds, underpins the Vietor Triangle’s structure. As a widely accepted standard for phonetic transcription, the IPA facilitates accurate pronunciation across languages. The Vietor Triangle applies this system in a pedagogically purposeful way by serving as a modality that reinforces vowel recognition and pronunciation in English language education. Its value lies in its capacity to support learners' acquisition of standard phonetic representations, which are foundational to effective second language learning.

Wilhelm Vietor’s critique of traditional language instruction methods led him to advocate for a phonetics-based reform in language pedagogy. His 1886 pamphlet catalyzed the Reform Movement in Europe, emphasizing the scientific teaching of pronunciation as a core linguistic skill. By championing phonetic instruction grounded in empirical evidence, Vietor underscored the importance of auditory discrimination and articulatory awareness in learning foreign languages (Vietor, 2023).

Research supports the pedagogical utility of vowel triangles in language instruction. For example, Huang (2016) conducted experimental research analyzing English vowel pronunciation errors among college students using phonetic methods. The study identified frequent misarticulations related to tongue positioning and lip shape. Through targeted voice training based on these findings, students demonstrated improved pronunciation accuracy and greater engagement with phonetics instruction. This highlights the value of integrating vowel-based models into systematic pronunciation training. In a related study, Dellwo and Huckvale (2007) explored how individual speaker traits, such as physiology, linguistic background, and psychological state, which manifest in speech. Their work emphasized that individual variation can be captured at multiple linguistic levels, including the spectral properties of vowel sounds. The study employed a standardized phonetic classification system, which reinforce the role of IPA-based vowel models like the Vietor Triangle in analyzing and teaching speech patterns effectively.

These studies collectively demonstrate the relevance of phonetic symbol systems in understanding different phenomena and behaviours relating to learning and teaching. The Vietor Triangle, grounded in IPA principles, supports not only pronunciation but also broader linguistic competencies such as listening comprehension, phonological awareness, and cross-linguistic analysis. Overall, these studies support the integration of structured, multimodal, and phonetics-based tools like the Vietor Triangle in language teaching. By making abstract linguistic concepts more concrete and accessible, such approaches help build pronunciation accuracy, linguistic confidence, and overall communicative competence.

2. material and methods

**2.1 Research Design**

This quasi-experimental research employed the pretest-posttest non-equivalent research design. This design is often used in classroom experiments when the experimental and the control groups are naturally assembled groups as intact classes which may be similar. This research design provides control of when and on whom the measurement is applied.

Two intact groups were used in this study. The experimental group A was exposed to the Color Vowel Approach, while the Control group B was exposed to the traditional approach using the Vietor Triangle in teaching pronunciation.

**2.2 The Subjects**

The subjects of this study, purposively sampled, were composed of two classes enrolled in the subject Speech and Oral Communication (Speech 111) in the College of Science. There were two groups of subjects in the study, the control and experimental groups. The first class, being the control group, was exposed to the use of the Vietor Triangle in teaching pronunciation. It was composed of 29 BS Marine Biology and Environmental Science students. On the other hand, the second class, which was composed of 30 BS Biology students, became the experimental group with whom was used the Color Vowel Approach in teaching pronunciation.

**2.3 Research Instrument**

The main research instruments were a pretest and a posttest. These tests which were both researcher-made took the form of oral and written evaluations. The pretest was a 30-item written test and a 30-item oral test. Similarly, the posttest was composed of 30 items for the written test and oral test. In the oral test, each item was equivalent to two points, one for the correct pronunciation of the word that received the primary stress and another one point for the correct production of the vowel sound or color vowel in the stressed syllable. Thus, the oral test had a total score of 60 points. Overall, the test combining the oral (60 points) and written (30 points) tests had a total of 90 items. The items were categorized at word, phrase, and sentence levels. The instruments for the pretest and posttest were composed of items from the session guides crafted relative to the lessons taught. Specifically, the pretest and posttest made use of some of the specialized words related to the course of the subjects and variants in learning vowel sounds in combination with some generic words in English. The test also included variants in the sounds of English. These were taken collectively from the lessons that were undertaken during the experiment.

**2.4 Scoring and Interpretation**

For the interpretation of data concerning the written and oral pretest and posttest, numerical values were assigned in measuring the variables for statistical computation and subsequent analysis. In the conduct of the oral test, the students were given a copy of the test. The researcher demonstrated first how they would answer the test. Afterwards, the student pronounced the word followed by the production of the stressed vowel sounds in the stressed syllable. The stressed syllable of the word, phrase, or sentence is already identified by having them capitalized and written in bold face. Also, the stressed vowel sound is written in red ink. For example, the word “**PEA**nut” is pronounced /ˈpinət/ with the stressed vowel sound as in /ee/. In other words, every item is equivalent to two points; one for the correct pronunciation of the word, phrase or sentence that received the primary stress and the other for the correct production of the vowel sound in the stressed syllable. Additionally, the written test reflected the stressed syllable of the words, phrases, and sentences to be answered by having them written in the same format as that of the oral test. The students identified and wrote the IPA phonetic symbol that represented the stressed vowel sound guided by the phonetic chart provided in the test. Every correct answer was equivalent to one point.

In analyzing the 90-item pretest and posttest of the students in the control and experimental groups, mean score was applied with the following scoring and interpretation:

List 1 : **Scoring scale and interpretation**

| **Score Range** | **Interpretation** |
| --- | --- |
| **73 – 90** | **Excellent** – Demonstrates consistent accuracy in pronunciation. Clear articulation, correct stress, and vowel production at word, phrase, and sentence levels. |
| **55 – 72** | **Above Average** – Mostly accurate pronunciation with minor errors. Speech is generally clear and intelligible. |
| **37 – 54** | **Average** – Partial accuracy. Some correct articulation and stress, but inconsistent across tasks. Intelligibility may vary. |
| **19 – 36** | **Below Average** – Frequent errors. Difficulty producing correct vowel sounds and stress. Limited intelligibility. |
| **1 – 18** | **Poor** – Very weak performance. Major difficulties with pronunciation, making speech often unintelligible. |

Moreover, the same conditions were satisfied in the conduct of the daily assessment before and during the intervention particularly on the identification of the stressed vowel sounds to be answered and combination of the specialized words relative to the respondents’ course and generic words in English. Seven sessions were accounted before the start of the experiment. Similarly, seven daily formative tests were given during the intervention. These included the topics: Introduction of Vowel Sounds of English, Variants, Characteristics of the Vowel Sounds, Vietor Triangle or Color Vowel Approach, Front Vowels, Back Vowels, Central Vowels, and Diphthongs. The results of the daily assessment of the two groups were compared to complement the results of the pretest and posttest. Furthermore, the results of the formative test before the start of the intervention were recorded in order to determine if the performance of both groups increased or decreased even before they were exposed to the target methodology in teaching pronunciation.

These tests made use of the 40-60 grade transmutation regardless of the total number of items for every formative test before and during the intervention. This passing percentage is generally used and applied for Speech classes in the University. Consequently, the pretest, posttest, and daily assessment results were transmuted and interpreted using the following transmutation based on Section 2, Chapter 20 Examinations and Grades of the University Code.

List 2 : **Transmuted rating and corresponding interpretation**

 **Scores Transmuted Rating Interpretation**

96 - 100 1 Excellent

94 - 95 1.25 Superior

92 - 93 1.5 Very Good

89 - 91 1.75 Good

87 - 88 2 Highly Satisfactory

84 - 86 2.25 Very Satisfactory

82 - 83 2.5 Satisfactory

79 - 81 2.75 Moderately Satisfactory

75 - 78 3 Fair

0 - 74 5 Poor

**2.5 Validation of Research Instrument**

The researcher-made oral and written pretest and posttest used as instruments in gathering data from the subjects were sent critiqued by language professors of the University and experts on test construction. Subsequently, the tests were validated in another Speech class of the College of Education handled by the researcher in the same semester and school year. During the validation of the instruments, the researcher observed that the students who took the test found a difficulty in understanding the instructions. This specifically pertained to understanding the meaning of the stressed syllable in a word and how the students could identify such in word, phrase, and sentences levels. Some had no prior knowledge of this concept. Another was the blurry representation of the Vietor Triangle which triggered a lot of questions that the researcher clarified. These observations during validation were recorded by the researcher as subjects for revision and approval from the language professors who critiqued the instruments. As a result, the researcher modified the instructions. The stressed syllable in a word was capitalized and the vowel sound was written in red ink. In this way, the students were guided on how to answer the oral and written test. All revisions made in the test were approved by the language professors.

**2.6 Data Gathering Procedure**

After the research instruments, the pretest and posttest, were critiqued and checked by experts on test construction and validated in another Speech class in the College of Education, the researcher asked permission from the Dean of the College of Arts and Communication through the Chair of the Languages Department to conduct the study with the identified two classes enrolled in Speech and Oral Communication for the second semester under his workload. The classes met twice a week on Tuesdays and Thursdays. To avoid bias and maintain the naturalness of the groups, these two classes were handled by the researcher from the start until midterm. The two Speech classes were scheduled in the afternoon particularly 1:00 to 2:30 for the experimental group and 4:00 to 5:30 for the control group. The first week of classes was intended for the usual orientation on the course and VMGO presentation. This was followed by the first formal lesson on the topics specified in the course syllabus. In addition, at the end of every lesson, the researcher administered a formative test to measure the student performance. Seven sessions were conducted before the pretest. After the first four weeks of classes, the pretest in the form of oral and written tests were conducted with both groups. Then, the intervention was introduced for the following seven sessions. Before the intervention was administered, the researcher introduced first the variants of words, particularly on spelling and sounds. The experiment started in the fifth week of classes. The same was true in the following weeks in the course of experiment. The researcher had a journal of his daily observations of the performance and behavior of the students during the classes. The results of the assessment in both groups on a per session basis from the start of the experiment were compared and analyzed to enrich the findings of the study. Aside from this, the researcher made use of the time series design in the form of a comparison test. The scores of the formative tests conducted in the first four weeks before the start of the intervention were compared with the scores accumulated from the per session assessment in the second four weeks during the experiment. Thereafter, the researcher conducted the posttest to the control and experimental groups. The researcher was personally in-charge in facilitating as well as retrieval, and evaluation of the instrument. Then, the classes continued following the sequence of topics or lessons stipulated in the course syllabus.

The study started on January 15 and culminated on March 29 covering the whole midterm period for the Second Semester, School Year 2018-2019. For proximity to the researcher’s office in the College of Education Student Resource Center, he decided that classes be transferred from the College of Science to the College of Education. He borrowed necessary instructional materials like LCD projector, among others. Thus, the study was completed after nine (9) weeks following the Tuesday-Thursday schedule for every week.

**2.7 Data Analysis**

The t-test for correlated samples was used in comparing the means before and after the treatment or the pretest and the posttest of the control and experimental groups. The t-test for two independent samples or groups was used to compare two means, the means of two independent samples particularly the pretest results of the control and experimental groups and their posttest results.

3. results and discussion

**3.1 Pretest Results of the Control and Experimental Groups**

**Table 1. Pretest Results of the Control and Experimental Groups**

|  |  |  |
| --- | --- | --- |
| Pretest Results | Control Group | Experimental Group |
| Descriptive Rating | Range | F | % | F | % |
| Above Average | (55-72) | 1 | 3.45 | 0 | 0.00 |
| Average | (37-54) | 6 | 20.69 | 12 | 40.00 |
| Below Average | (19-36) | 20 | 68.97 | 18 | 60.00 |
| Poor | (1-18) | 2 | 6.90 | 0 | 0.00 |
| TOTAL | 29 | 100.00 | 30 | 100.00 |
| Mean | 30.55 =Below Average | 34.13 =Below Average |

Table 1 presents the pretest results of the control and experimental groups, indicating a generally low level of pronunciation proficiency prior to any instructional intervention. Based on a rubric-informed scoring system, scores were categorized into four performance levels: Poor (1–18), Below Average (19–36), Average (37–54), and Above Average (55–72). These labels were derived from the institution’s standardized performance benchmarks, where each range corresponds to specific indicators of vowel articulation accuracy, stress placement, and intelligibility.

In the control group (n=29), the majority (68.97%) scored below average, with a mean score of 30.55. Only one student (3.45%) scored above average. Most students struggled with identifying and producing stressed vowel sounds at word, phrase, and sentence levels, resulting in poor oral and written test outcomes. This finding aligns with previous studies (Thomson, 2018; Darcy, 2018) that highlight the persistent challenge learners face when transitioning from receptive awareness of vowel distinctions to productive accuracy, particularly in the absence of targeted instructional scaffolding.

In the experimental group (n=30), 60% scored below average and 40% scored average, with a slightly higher mean of 34.13. Similar to the control group, students showed fair articulation skills but poor performance in recognizing and producing stressed vowels, especially in written tasks. Although this group's scores were marginally better, they still reflected limited phonological awareness and articulation control. Students generally demonstrated fair articulation at the segmental level but lacked consistent accuracy in stress placement and vowel length differentiation—skills essential for intelligible speech (Jenkins, 2015; Walker, 2021). Overall, both groups demonstrated weak pronunciation skills prior to the intervention.

**3.2 Posttest Results of the Control and Experimental Groups**

**Table 2. Posttest Results of the Control and Experimental Groups**

|  |  |  |
| --- | --- | --- |
| Posttest Results | Control Group | Experimental Group |
| Descriptive Rating | Range | F | % | F | % |
| Excellent | (73-90) | 2 | 6.90 | 7 | 23.33 |
| Above Average | (55-72) | 8 | 27.59 | 17 | 56.67 |
| Average | (37-54) | 18 | 62.07 | 6 | 20.00 |
| TOTAL | 29 | 100.00 | 30 | 100.00 |
| Mean | 52.03 =Average | 62.93 =Above Average |

Table 2 shows the posttest results of the control and experimental groups. In the control group, most students (62.07%) scored within the average range, while 27.59% were above average and 6.90% reached the excellent level, yielding a mean score of 52.03 (average rating). Students generally showed very satisfactory articulation of words and phrases but continued to struggle with identifying stressed vowel sounds, particularly in written tasks. As a result, their overall performance was rated satisfactory.

While students showed improved word and phrase articulation, difficulties remained in accurately identifying stressed vowel sounds, particularly in written assessments. This limited progress suggests that conventional instructional strategies—absent of specialized pronunciation scaffolds may not sufficiently address learners’ phonological gaps. These results are consistent with findings from Darcy (2018), who argues that without targeted interventions, learners may level off in pronunciation development, particularly in suprasegmental awareness.

In contrast, the experimental group demonstrated stronger results, with a mean score of 62.93 (above average). Over half (56.67%) scored above average, 23.33% scored excellent, and only 20% were in the average range. Most students in this group showed excellent to very satisfactory performance in articulating words, phrases, and sentences and in identifying the corresponding stressed vowel sounds using the Color Vowel Approach. Their oral and written test outcomes were rated as highly satisfactory overall, which indicate notable improvement in pronunciation skills after the intervention. These results indicate that the Color Vowel Approach had a notable impact on students’ ability to produce and recognize vowel sounds and stress patterns more accurately and confidently.

The CVA’s visual and kinesthetic design likely contributed to increased phonemic awareness and intelligibility, as learners were able to anchor vowel sounds using color-symbol associations (Taylor & Thompson, 2016). This aligns with Thomson’s (2018) and Darcy’s (2018) findings that perceptual salience and variability in input enhance L2 vowel acquisition. Furthermore, the improvement seen in the experimental group supports Jenkins’ (2015) and Walker’s (2021) emphasis on teaching for intelligibility, especially in English as a Lingua Franca (ELF) contexts, where consistent stress and vowel production are critical to mutual understanding.

In summary, while both groups improved, the experimental group’s performance indicates that integrating the Color Vowel Approach into pronunciation instruction can significantly enhance learner outcomes. This underscores the value of multimodal, intelligibility-focused methods in the development of effective, contextually relevant pronunciation skills.

**3.3 Test of Difference between the Pretest Results of the Control and Experimental Groups**

**Table 3. Test of Difference between the Pretest Results of the Control and Experimental Groups**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Group | Mean | Difference | t-stat | Sig. | Interpretation |
| Control | 30.55 | 3.58 | 1.509 | 0.137 | Not significant |
| Color Vowel Approach | 34.13 |

Table 3 presents the results of the independent samples t-test comparing the pretest scores of the control and experimental groups. The computed *t*-value was 1.509 with a significance level of *p* = 0.137, which is greater than 0.05. This indicates no statistically significant difference between the two groups prior to the intervention. The mean score of the control group was 30.55, while the experimental group scored slightly higher at 34.13, both falling within the below average range.

This result confirms that both groups had comparable levels of pronunciation skills and knowledge in Speech and Oral Communication at baseline, which validate their suitability for the intervention. Subtest results further support this finding: the control group generally performed poorly in both oral and written tasks, especially in producing and identifying stressed vowel sounds. Meanwhile, the experimental group showed slightly better, though still fair, performance, particularly in articulation and recognition of vowel sounds at the word, phrase, and sentence levels.

Subtest analyses further support this equivalence. In both groups, students demonstrated limited ability to articulate and identify stressed vowel sounds, particularly in written form. The experimental group exhibited slightly stronger articulation at the phrase and sentence levels, yet their overall performance still reflected foundational gaps in phonological awareness and vowel stress recognition. These findings echo earlier research (Celce-Murcia et al., 2010) indicating that L2 learners often begin with underdeveloped suprasegmental awareness, which underscore the need for focused pronunciation instruction.

**3.4 Test of Difference between the Posttest Results of the Control and Experimental Groups**

**Table 4. Test of Difference between the Posttest Results of the Control and Experimental Groups**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Group | Mean | Difference | t-stat | Sig. | Interpretation |
| Control | 52.03 | -10.9 | 3.615 | 0.001 | Significant |
| Color Vowel Approach | 62.93 |

Table 4 displays the results of the independent samples t-test comparing the posttest scores of the control and experimental groups. The analysis yielded a *t*-value of 3.615 and a significance level of *p* = 0.001, indicating a statistically significant difference between the groups. The experimental group achieved a higher mean score (M = 62.93) compared to the control group (M = 52.03), which confirm the effectiveness of the Color Vowel Approach in enhancing pronunciation skills.

Posttest subtest results show that the control group demonstrated satisfactory oral performance, with good articulation of words and moderately satisfactory production of stressed vowel sounds. Their written performance was also satisfactory, particularly in identifying phonetic symbols at phrase and sentence levels. Their responses showed greater control over vowel quality and rhythm, which are key features associated with intelligible speech (Jenkins, 2015; Walker, 2021).

By contrast, students in the experimental group consistently exhibited above average to excellent performance in both oral and written components, particularly in producing and recognizing stressed vowel sounds across word, phrase, and sentence levels. Their responses showed greater control over vowel quality and rhythm, which are key features associated with intelligible speech (Jenkins, 2015; Walker, 2021).

These results align with previous research highlighting the impact of explicit, multimodal pronunciation instruction (Darcy, 2018; Taylor & Thompson, 2016). The Color Vowel Approach, by combining auditory, visual, and kinesthetic cues, appears to facilitate enhanced phonemic awareness and stress sensitivity, two components critical for effective spoken communication (Thomson, 2018). The significant posttest improvement observed in the experimental group reinforces findings by Putri and Adawiah (2024), who noted the CVA's adaptability to learners’ individual styles and its effectiveness in building learner confidence and accuracy in vowel production.

In sum, the statistical and practical significance of the posttest outcomes suggests that the Color Vowel Approach is not only a pedagogically sound tool but also a transformative one in pronunciation instruction. Its capacity to integrate pronunciation into meaningful classroom interaction addresses a common gap in traditional instruction.

**3.5 Test of Difference between the Pretest and Posttest Results in the Control Group**

**Table 5. Test of Difference between the Pretest and Posttest Results in the Control Group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Control Group | Mean | Difference | t-stat | Sig. | Interpretation |
| Posttest | 52.03 | 21.48 | -20.44 | 0.000 | Significant |
| Pretest | 30.55 |

Table 5 shows the results of the paired samples t-test comparing the pretest and posttest scores of the control group. The analysis yielded a *t*-value of -20.44 with a significance level of *p* = 0.000, indicating a statistically significant improvement. The mean score increased from 30.55 (below average) in the pretest to 52.03 (average) in the posttest. This demonstrates that students exposed to the traditional method of teaching pronunciation using phonetic symbols and the Vietor Triangle showed measurable gains in their pronunciation skills.

This improvement suggests that even traditional methods of pronunciation instruction, such as the use of phonetic symbols and the Vietor Triangle, can produce measurable gains in learner performance when systematically applied. The Vietor Triangle, grounded in articulatory phonetics, provides a schematic representation of vowel placement and mouth positioning, which may have supported students’ understanding of vowel production (Howatt, 1984).

Subtest results support this improvement. Students progressed from moderately satisfactory to good word articulation, poor to moderately satisfactory production of stressed vowel sounds, and fair to highly satisfactory pronunciation of phrases and sentences. In the written test, identification of phonetic symbols also improved from poor to moderately satisfactory at the word level and from fair to satisfactory at the phrase and sentence levels. Overall, the control group’s performance improved from a poor rating in the pretest to a satisfactory rating in the posttest.

While the control group’s growth confirms the utility of explicit phonetic instruction, the relatively modest posttest mean (52.03) reflects the limitations of traditional methods when used in isolation. As Darcy (2018) notes, without perceptually rich and interactive input, gains in pronunciation may be constrained by cognitive load and lack of contextualized feedback. Nonetheless, this result validates the foundational role that phonetic awareness can play in supporting pronunciation learning, particularly when integrated consistently over time.

**3.6 Test of Difference between the Pretest and Posttest Results in the Experimental Group**

**Table 6. Test of Difference between the Pretest and Posttest Results in the Experimental Group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Control Group | Mean | Difference | t-stat | Sig. | Interpretation |
| Posttest | 62.93 | 28.2 | -20.68 | 0.000 | Significant |
| Pretest | 34.13 |

Table 6 displays the results of the paired samples t-test comparing the pretest and posttest scores of the experimental group. The analysis yielded a *t*-value of -20.68 with a significance level of *p* = 0.000, indicating a statistically significant improvement. The mean score increased from 34.13 (below average) in the pretest to 62.93 (above average) in the posttest, demonstrating a substantial enhancement in pronunciation skills following the use of the Color Vowel Approach.

This marked gain reflects the effectiveness of the Color Vowel Approach in enhancing both segmental and suprasegmental features of spoken English. Rooted in multimodal learning principles, the CVA supports students’ ability to associate vowel sounds with visual and kinesthetic cues (Taylor & Thompson, 2016). These cues appear to have strengthened students’ phonemic awareness and stress recognition, which are skills closely tied to intelligibility (Jenkins, 2015; Darcy, 2018).

Subtest results reflect consistent improvement: students progressed from moderately satisfactory to excellent in word articulation, from poor to very satisfactory in producing stressed vowel sounds, and from fair to good in phrase and sentence pronunciation. Similar gains were observed in the written test, where students improved from fair to very satisfactory in identifying phonetic symbols at the word level, and from fair to highly satisfactory at the phrase and sentence levels. Overall, the experimental group advanced from a fair rating in the pretest to a highly satisfactory performance in the posttest.

These results align with prior research showing the value of interactive, perceptually rich instruction in promoting L2 pronunciation accuracy (Thomson, 2018; Putri & Adawiah, 2024). The CVA’s structured yet flexible design allowed students to engage with pronunciation meaningfully and reinforce pronunciation not as an isolated drill, but as an integrated, ongoing component of language use.

Overall, the experimental group’s progress highlights the pedagogical influence of the Color Vowel Approach and supports its application in diverse instructional contexts where pronunciation intelligibility and learner confidence are priorities.

**3.7 Summary of the Formative Test Results before the Intervention**

**Table 7**. **Assessment Results on a Per Session Basis of the Control and Experimental Groups**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sessions*(Before the Intervention)* |  | Control Group | Experimental Group |  | Difference | t-stat | Sig. | Interpretation |
|  | **Mean** | **Score** | **Descriptive Rating** | **Mean** | **Score** | **Descriptive Rating** |  |
| Ses. 1 | Relationship of Language, Speech, & Communication | 13.55 | 87.10 | Highly Satisfactory | 14.17 | 88.33 | Highly Satisfactory |  | -0.62 | 0.837 | 0.406 | NS |
| Ses. 2 | Speech Mechanics | 14.51 | 89.03 | Good | 14.76 | 89.53 | Good |  | -0.25 | 0.277 | 0.783 | NS |
| Ses. 3 | Speaking Process | 15.34 | 90.69 | Good | 18.77 | 97.53 | Excellent |  | -3.43 | 5.767 | 0.000 | S |
| Ses. 4 | Function and Types of Communication | 16.66 | 93.31 | Very Good | 18.43 | 96.87 | Excellent |  | -1.77 | 3.115 | 0.003 | S |
| Ses. 5 | Elements and Other Types of Communication | 13.21 | 95.22 | Superior | 14.57 | 98.84 | Excellent |  | -1.36 | 2.314 | 0.024 | S |
| Ses. 6 | The Desirable Speaking Voice | 9.59 | 98.34 | Excellent | 9.1 | 96.40 | Excellent |  | 0.49 | 1.322 | 0.192 | NS |
| Ses. 7 | Factors that Aid Voice Projection | 13.76 | 87.52 | Highly Satisfactory | 16.1 | 92.20 | Very Good |  | -2.34 | 3.024 | 0.004 | S |
| TOTAL |  | 96.62 | 91.60 | Very Good | 105.9 | 94.24 | Superior |  | -9.28 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sessions*(During the Intervention)* |  | Vietor Triangle | Color Vowel Approach |  | Difference | t-stat | Sig. | Interpretation |
|  | **Mean** | **Score** | **Descriptive Rating** | **Mean** | **Score** | **Descriptive Rating** |  |
| Ses. 1 | Vowel Sounds of English | 20.59 | 83.53 | Very Satisfactory | 27.5 | 91.43 | Good |  | -6.91 | 3.674 | 0.000 | S |
| Ses. 2 | Characteristics and Variants of Vowel Sounds | 14.03 | 88.07 | Highly Satisfactory | 15.5 | 91.00 | Good |  | -1.47 | 2.123 | 0.038 | S |
| Ses. 3 | Vietor Triangle | 19.59 | 82.38 | Satisfactory | 26.37 | 90.13 | Good |  | -6.78 | 7.256 | 0.000 | S |
| Ses. 4 | Front Vowels | 10.83 | 88.87 | Good | 12.63 | 93.69 | Superior |  | -1.8 | 2.640 | 0.012 | S |
| Ses. 5 | Central Vowels | 14.03 | 88.07 | Highly Satisfactory | 16.4 | 92.80 | Very Good |  | -2.37 | 3.985 | 0.000 | S |
| Ses. 6 | Back Vowels | 11.86 | 91.63 | Very Good | 13.83 | 96.89 | Excellent |  | -1.97 | 3.822 | 0.000 | S |
| Ses. 7 | Diphthongs | 14.41 | 88.83 | Good | 17.67 | 95.33 | Superior |  | -3.26 | 4.418 | 0.000 | S |
| TOTAL |  | 105.34 | 87.34 | Highly Satisfactory | 129.9 | 93.04 | Very Good |  | -24.56 |  |  |  |

Table 7 presents the formative test results of the control and experimental groups across seven sessions conducted prior to the intervention. These sessions, based on the approved course syllabus, covered foundational lessons leading up to the instruction on vowel sounds and the application of the Color Vowel Approach.

Independent samples *t*-tests revealed no significant differences in Session 1 (*P* = .41) and Session 2 (*P* = .78), where both groups performed at highly satisfactory and good levels, respectively. However, significant differences were noted in Sessions 3, 4, 5, and 7 (*P* = .001, *P* = .003, *P* = .02, and *P* = .004, respectively), with the experimental group consistently outperforming the control group. The experimental group earned excellent ratings across these sessions, while the control group ranged from good to very good.

The performance gap appeared linked to student engagement and attendance. Observational data and learning logs indicated that students in the experimental group were more active in discussions and classroom activities. In contrast, some control group members expressed discomfort in early class interactions, which may have affected their formative performance.

In Session 6, no significant difference was observed (*P* = .19), and both groups achieved excellent ratings. Overall, while both groups demonstrated a range of satisfactory to excellent outcomes during the pre-intervention phase, the experimental group showed greater consistency. These results established a baseline for measuring the effectiveness of the intervention in subsequent sessions.

**3.8 Summary of the Formative Test Results during the Intervention**

In conjunction with the formative assessments before the intervention, there were also seven sessions conducted in the course of the experiment complementing the number of hours needed to complete the midterm period. The control group was exposed to the traditional method of teaching pronunciation using the Vietor Triangle, while the experimental group employed the Color Vowel Approach. Both methodologies in teaching pronunciation were integrated in the following seven sessions.

In Session 1 on *Vowel Sounds of English*, the experimental group significantly outperformed the control group (*t* = 3.674, *P* = .001), earning a very satisfactory rating versus a good rating. This trend continued in Session 2 (*Characteristics and Variants of Vowel Sounds*) with the same *t*-value and significance level, confirming the experimental group’s better performance (*P* = .001). In Session 3, which focused on the *Color Vowel Chart* for the experimental group and the *Vietor Triangle* for the control group, a highly significant difference was observed (*t* = 7.256, *P* < .001), with the experimental group achieving a good rating and the control group a satisfactory rating. Significant differences were also observed in Session 4 (*Front Vowels*, *t* = 2.640, *P* = .01), Session 5 (*Central Vowels*, *t* = 3.985, *P* < .001), Session 6 (*Back Vowels*, *t* = 3.822, *P* < .001), and Session 7 (*Diphthongs*, *t* = 4.418, *P* < .001), with the experimental group consistently earning higher performance ratings ranging from very good to excellent.

Although both groups showed high scores prior to the intervention, there was a slight dip in average performance during the experiment. This is attributed to the increased complexity of the lessons and assessment items, which moved beyond recall to the analysis level of Bloom’s Taxonomy. While pre-intervention tests focused on basic knowledge, the intervention-phase assessments required students to analyze, distinguish, and apply phonological patterns. The experimental group maintained a high average score of 93.04% during the intervention (compared to 94.24% pre-intervention), whereas the control group’s performance dropped more sharply from 91.60% to 87.34%. When combining performance before and during the intervention, the experimental group obtained a superior rating (93.64%), while the control group was rated good (89.47%).

In summary, all seven formative test results during the intervention revealed significant differences favoring the experimental group. These findings affirm the effectiveness of the Color Vowel Approach in enhancing pronunciation skills, particularly in articulating and producing vowel sounds at word, phrase, and sentence levels.

4. Conclusion

The findings of this quasi-experimental study revealed that students in both the control and experimental groups demonstrated low performance in the pretest, indicating limited knowledge in oral communication, particularly in pronunciation. However, both groups showed improved scores in the posttest, which suggest overall gains in articulating words, phrases, and sentences, as well as in producing vowel sounds. A comparison of the pretest scores showed no significant difference between the two groups, confirming that they started with comparable levels of pronunciation skills and were appropriate subjects for the intervention. In contrast, the posttest results indicated a significant difference in favor of the experimental group, which demonstrate that students exposed to the Color Vowel Approach outperformed those who received traditional instruction. This supports the effectiveness of the Color Vowel Approach in enhancing pronunciation skills.

Further analysis within each group also revealed significant improvements from pretest to posttest. In the control group, scores rose from below average to average, implying that the traditional method, which included the use of the Vietor Triangle, had a positive but limited influence on pronunciation performance. Meanwhile, the experimental group showed a more substantial increase from below average to above average, which further reinforce the effectiveness of the Color Vowel Approach in developing students' pronunciation at the word, phrase, and sentence levels.

Additionally, formative assessments conducted across seven sessions before the intervention showed that both groups performed from highly satisfactory to excellent. During the intervention period, formative test results further improved, ranging from good to excellent, indicating that both instructional approaches contributed to progressive learning. However, a comparative analysis of formative test results between groups revealed a significant difference favoring the experimental group. This suggests that the sustained use of the Color Vowel Approach consistently led to higher performance levels and greater improvements in pronunciation skills throughout the intervention period.

Ethical APPROVAL AND CONSENT

this study strictly adhered to ethical standards for conducting research involving human participants. participation was entirely voluntary, and written informed consent was obtained from all participants prior to data collection. to ensure anonymity and confidentiality, identification codes were used in place of personal information, and all data were securely stored. the research protocol received approval from the institutional ethics committee, and all procedures were conducted in compliance with the Data Privacy Act of 2012.

DISCLAIMER (USE OF ARTIFICIAL INTELLIGENCE TOOLS)

The author declares that no generative artificial intelligence (AI) technologies, including large language models, were used in the writing, editing, text-to-image creation, or substantive content generation of this manuscript.

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