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**Research paper**

# The Effect of Pictorial Minimal Pair-based Stories on EFL Beginners' Pronunciation Accuracy and Vocabulary Recall

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## Abstract

This study investigated the effect of pictorial minimal pair-based stories on pronunciation accuracy and vocabulary recall among Iranian EFL beginners. Forty-five FFL learners of a language institute aged 11 to 13 were assigned to one control group and two experimental groups. The researchers taught the control group through stories without pictures and minimal pairs. Experimental group 1 used stories, pictorial minimal pairs, and pictures, while experimental group 2 used stories and pictorial minimal pairs without pictures. The current study used a researcher-made test of vocabulary and pronunciation as pre- and post-tests. The researchers ran one-way ANOVA to determine the significance of changes in performance, with an alpha level set at $p < 0.05$. After eight sessions, post-tests displayed that experimental group 1 had significantly better pronunciation accuracy than the control group. However, there were no significant differences in vocabulary recall among the groups. The study proposes visual aids improve pronunciation but may not significantly influence vocabulary acquisition, highlighting the need for targeted strategies to improve both areas. The findings of this study are valuable for language teachers, curriculum designers, and teacher educators. It recommends incorporating pictorial stories with minimal pair vocabularies to improve pronunciation teaching.

***Keywords:*** Pronunciation Accuracy, Vocabulary Recall, Pictorial Minimal Pairs, EFL Learners
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## Introduction

Pronunciation plays a critical role in the teaching and learning of EFL learners by increasing their understanding of native and native-like speakers and enhancing their communication skills. However, EFL teachers frequently face problems in conducting pronunciation lessons (Aydin & Akyüz, 2017). Conflicting instructional approaches and the lack of clear guidelines lead to significant challenges in teaching English pronunciation. Moreover, the lack of established methods compounds this complexity, making it difficult for teachers to determine the most operational strategies for teaching pronunciation. Therefore, instructors often struggle with deciding what aspects of pronunciation to concentrate on, the appropriate timing for teaching, and the best techniques to use. These concerns indicate the need for more comprehensive and coherent guidelines to help teachers deliver effective pronunciation instruction (Pourhosein Gilakjani, 2016).

Nowadays, insufficient pronunciation abilities have reduced confidence among language learners and hindered their ability to communicate effectively (Pourhosein Gilakjani, 2012). Various instructional materials, like visual aids, have been used for teaching, contributing to improved recall and skill performance. Integrating different visual elements enhances learners' engagement and understanding. (Brown, 2004; Hashemifardnia, et al., 2018).

Additionally, using minimal pair techniques increases pronunciation abilities, fluency, and intonation, demanding a better understanding of syllabification within words or sentence components (Dewi & Astriyanti, 2021; Long, 2016). These techniques develop phonological processing abilities, listening speed, critical thinking, and oral communication, contributing to fluency and accuracy (Torres Jiménez & Rojas Castillo, 2020). Visual aids, such as pictures, are influential instructional materials for teaching minimal pairs (Hashemifardnia et al., 2018).

Pictures with minimal pairs can significantly enhance learners' engagement, confidence, and curiosity (Creel & Frye, 2024).

Vocabulary recall refers to the skill of retrieving words from memory and practicing them properly in productive language tasks like speaking. It is the ability to identify and recall the meaning of words when encountered in receptive and productive tasks (Nation, 2001). Recently, instructors have focused on vocabulary learning strategies because of their potential to enhance the acquisition and retention of vocabulary in second or foreign languages (Atay & Ozbulga, 2007).

Thornbury (2006) stated that integrating pictorial stories can considerably enhance the learning and retention of new vocabulary by providing contextual cues that help comprehension and memorization. These visual narratives support young learners in associating words with images, improving their ability to store and retrieve vocabulary. However, in Iran, one common problem in vocabulary recall among Iranian EFL learners is the ineffectiveness of traditional teaching methods (Farrokhi et al., 2025; Savojbolaghchilar et al., 2023; Shafaei & Rahim, 2015).

The present study aimed to find any significant effect of minimal pair picture-based activities on pronunciation accuracy and vocabulary recall of EFL Iranian beginner learners in language institutes. This study answered the following research questions:

1. To what extent have pictorial minimal pair-based stories significantly affected the pronunciation accuracy of EFL beginners?
2. To what extent have pictorial minimal pair-based stories significantly affected the vocabulary recall of EFL beginners?

# Review of the Related Literature

By explaining the theoretical framework of the study, this research aims to illuminate how visual aids can enhance phonetic understanding and vocabulary retention. Moreover, this literature review describes the research variables, including pictorial minimal pair-based stories, pronunciation accuracy, and vocabulary recall within the context of language acquisition. Furthermore, this section will review related studies to provide insight into effective pedagogical strategies, emphasizing the significance of incorporating multimodal resources in language learning.

## Theoretical Framework of the Study

The current study, grounded on Dual Coding Theory, indicates that integrating concrete, high-imagery words and using verbal and nonverbal contexts are fundamental elements of teaching sight vocabulary (Sadoski, 2005). The Dual Coding Theory of cognition is a significant and well-supported framework in cognitive theory (Sadoski & Paivio, 2013). It identifies two separate subsystems in cognitive processing: a verbal and a nonverbal (imagery) system (Clark & Paivio, 1991).

Thompson and Paivio (1994) confirmed object pictures and complementary sounds enhanced memory retention. This finding supports the Dual Coding Theory's proclamation that the sensory components of multimodal objects act as independent functional components, consequently supporting this foundational assumption within the theory (Thompson & Paivio, 1994). Initially, research in Dual Coding Theory addressed memory and then extended to include other cognitive phenomena. However, memory preservation preserves its significance as the foundation of all knowledge and cognition. Furthermore, highlighting memory is further justified in this context

due to the fundamental role of learning and memory in educational objectives (Clark & Paivio, 1991).

Minimal pairs are defined by Ladefoged and Johnson (2020) as a significant part of linguistics, especially in the study of language sounds. They encompass two words almost the same, with one different sound. By changing that sound, the meaning of the word can change. In the current study, the researcher selected twenty-one minimal pairs, such as “boy and toy” and “boat and goat,” based on the students’ level and the textbook.

Using diverse instructional media increases recall among learners to enhance the targeted skill performance (Brown, 2004). Teachers employed a wide range of instructional such as visual aids (Hashemifardnia et al., 2018). The effective sequence of pictures within a narrative creates an association between the reader and the visual content, thus causing the implied meaning of the images (Matulka, 2008). The organized interaction between the story and the visual elements pushes the narrative forward (Hashemifardnia et al., 2018).

The minimal pair’s techniques assist students in improving their pronunciation abilities to reinforce fluency and facilitate various pronunciation exercises, ultimately guiding them towards reaching ideal pronunciation, better intonation, and better understanding of syllabification within words or sentence components (Toress Jiménez & Rojas Castillo, 2020). The pictorial minimal pair-based story included minimal pairs, such as a cat and a cap, are used in the story. They are phonetically similar, with a difference in one vowel or consonant (Altamimi, 2015). In the present study, the researchers visualized and represented them by pictures and telling a story.

Previous studies have utilized minimal pairs to teach pronunciation (Dewi & Astriyanti, 2021; Long, 2016, Rakat et al., 2024). Concerning multidimensional influences on language learning, including instructional, environmental, and psychological issues, several research has examined

L2 pronunciation, resulting in exploring the contentious domains of minimal pairs and pronunciation accuracy in language studies (Haghighi & Rahimi, 2017). Yule (2011) proposes that minimal pairs or minimal sets serve to assess phonemic differences in a language and are instrumental in teaching EFL/ESL students to distinguish the contrasts between them.

El-Nekhely et al. (2019) stated that the acquisition, retention, and recall of new vocabulary among kindergarten children is a critical feature of early childhood education. Integrating pictorial stories is an effective technique for this purpose. These visual narratives serve as a valuable instrument in increasing language development by providing contextual cues to facilitate comprehension and memorization of new words. Young learners can create meaningful associations between words and images through engagement with pictorial stories, thereby reinforcing their capacity to store and retrieve vocabulary effectively. Additionally, Mir and Gorjian (2025) demonstrated that organizing vocabulary through visual sorting techniques significantly enhanced learners' recall and retention, suggesting that pictorial input can play a vital role in vocabulary acquisition. It can strengthen memory traces and improve long-term retention.

Moreover, pronunciation is a significant component of effective and intelligible communication among EFL teachers and students in the classroom (Torres Jiménez & Rojas Castillo, 2020). While pronunciation is fundamental in EFL instruction and learning, EFL instructors encounter challenges in pronunciation classes (Aydin & Akyüz, 2017). These challenges are related to a lack of clear guidelines, a well-established systematic approach, and contradictory practices, resulting in a diminished emphasis on pronunciation and the challenges teachers confront in delivering pronunciation instruction (Pourhossein Gilakjani, 2016).

Nowadays, restricted pronunciation skills decrease confidence in language learners and limit their communication (Pourhosein Gilakjani, 2012). This issue demands a change in traditional

roles and responsibilities of teachers and learners and a reassessment of teaching methodologies and learning objectives to improve pronunciation proficiency. Pronunciation instruction shifts from the emphasis on native-like pronunciation to the primary aim of achieving intelligibility for successful communication (Suzukida, 2021). The ability to teach pronunciation is necessary for language instructors, given that language speaking and comprehension deal with practical pronunciation (Levis & Mccrocklin, 2018).

Unfortunately, teaching pronunciation is often ignored within EFL/ESL classrooms, teacher training programs, course materials, and applied linguistics studies (Aufa, 2017; Toress Jiménez & Rojas Castillo, 2020). Aydin and Akyüz (2017) stated that techniques, materials, and methods have an evident influence on teaching pronunciation meaningfully for learners' achievement. Consequently, teachers should enhance their knowledge and awareness of modern strategies and integrate them into their classes.

Toress Jiménez and Rojas Castillo (2020) believed that by using minimal pair techniques, students can develop their pronunciation skills by incorporating different exercises and pronunciation activities in pairs or as a whole group, where consonant practice and interaction are primary elements of every English class. Utilizing minimal pair techniques in language instruction improves students' phonological processing skills, leading to improved speed in listening, critical thinking, analysis, and oral communication. Moreover, this method contributes to developing fluency and accuracy in interaction.

Another variable of the present study is vocabulary recall. A strong source of vocabulary is central to effective communication (El-Nekhely et al., 2019). Without grammar, little can be conveyed. However, without vocabulary, nothing can be transferred (Wilkins, 1972). While some teachers might consider vocabulary acquisition straightforward, mastering new vocabulary has

constantly posed a challenge for learners (Nemati, 2009). Evaluating learners' vocabulary recall can reveal their acquisition of new vocabulary in the target language (Shafaei & Rahim, 2015). Using pictorial stories significantly increases the learning and retention of new vocabulary (Thornbury, 2004). The utilization of images in learning new material is significantly related to long-term memory retention (Nemati, 2009).

**Related Studies**

Hashemifardnia et al. (2018) examined the effect of using picture books as instructional material on vocabulary learning for Iranian elementary students. The students were assigned to experimental and control groups. To assess the impact of the treatment on vocabulary learning, the researchers conducted a post-test for vocabulary. The results displayed that the experimental group outperformed the control group.

Yanasugondha (2017) studied English vocabulary learning using the Dual Coding Theory with Thai EFL tertiary students at the beginning level. The data collection process focused on measuring the recognition and retention rate of the participants after three spaced presentations. The results showed that the group using simultaneous L2 to L1 translation and pictorial coding, regarding the principles of Dual Coding Theory, performed better than the other two groups in the immediate post-test and the one-month delayed post-test.

Haghighi and Rahimi (2017) examined the effect of L2 minimal pairs practice on Iranian intermediate EFL learners' pronunciation accuracy. The researchers assigned 30 Iranian intermediate EFL learners of Simin Institute participants to experimental and control groups. While the control group received a placebo, the experimental group received five sessions of teaching L2 pronunciation, focusing on Minimal Pairs Practice. The results revealed that the

experimental group performed better in the pronunciation test, demonstrating that L2 minimal pairs practice can improve pronunciation accuracy for intermediate EFL learners.

Coyne et al. (2014) examined the explicit vocabulary instruction principles within shared storybook reading sessions on the vocabulary development of kindergarten students at risk of reading difficulties. The results showed that learners in the intervention group with lower receptive vocabulary skills displayed better gains in explicitly taught vocabulary than their peers with higher receptive vocabulary skills.

The reviewed studies highlight the effectiveness of diverse instructional strategies, including pictorial materials and minimal pairs practice, in improving vocabulary acquisition and pronunciation accuracy among EFL learners. The findings suggest that visual aids and targeted practices improve outcomes in vocabulary recall and pronunciation skills. While these investigations provide helpful understandings into vocabulary learning and pronunciation improvement, they do not particularly address the integrated effect of pictorial minimal pair-based stories on these areas for EFL beginners. The present study attempts to fill in this gap by examining how integrating these methods can optimize language instruction for novice learners.

## Method

### Study Design

This study followed quasi-experimental method through pre-test and post-test design.

### Participants and Setting

The accessible population was 63 members. Regarding the homogeneity test, the researchers selected 45 participants. According to Cohen et al. (2007), experimental methodologies demand a

minimum of 15 participants. Consequently, the researchers of the present study selected 15 participants for each group (two experimental groups and one control group). Before starting the instruction, the researchers homogenized subjects using the Cambridge Key English Test (KET). The students' level was beginner (pre-A1), and their ages ranged between 11 to 13 years old. The process of selecting a sample was convenience sampling due to easier accessibility. This study was conducted in Derakhshan language classes at the language institute in Neyshabour.

**Instruments**

The instruments of this study included Cambridge Key English Test (KET), researcher-made test of pronunciation and researcher-made test of vocabularies.

The Cambridge Key English Test (KET) is an English language examination designed for beginners and elementary learners. As a component of the Cambridge English Qualifications, it evaluates the ability to utilize English in everyday situations. In the current study, the researchers employed this test to homogenize three distinct participant groups, ensuring a consistent baseline of language proficiency. Each group completed the examination with a standardized duration of 20 minutes, which targeted learners at the Pre-A1, starter, and beginner levels.

The test included three oral questions posed to each student after instruction. The researchers conducted eight tests to assess the validity of students' pronunciation. The test's reliability was estimated and administered to each experimental and control group. To calculate the test reliability, the researchers administered it to a group external to the sample in two separate sessions. There was a four-day interval between the two assessments.

The researcher-made vocabulary test was administered to students from the experimental and control groups as a pre-test and post-test. According to Karatas et al. (2021), a ten-day interval is

sufficient. Therefore, after ten days, the researcher administered the test for 20 minutes with 22 items. The researchers estimated the reliability of the test prior to conducting it. To calculate the reliability, the test was administered twice to a group external to the sample, with a four-day interval between the two assessments.

This study used three instructional materials: Let's Go book, pictorial minimal pairs, and AI-generated pictures.

The "Let's Go" series represents a structured approach to English language acquisition for children and primary school students. Published by Oxford Publishing House, these materials are designed to facilitate language learning through relatable content that resonates with the everyday experiences of young learners. Each book of this series comprises eight lessons that encompass themes integral to the lives of children, such as school, family, friends, and play.

The researcher has identified words from the books "Let's Go Begin 2" and "Let's Go 1" and created minimal pairs based on the students' proficiency levels. In the teaching process, the teacher has used these minimal pairs in two of the experimental groups. Additionally, these minimal pairs have been incorporated into pictorial short stories according to the student's proficiency levels.

Images of short stories based on minimal pairs and images generated for vocabulary post-tests were created by AI Copilot.

**Procedure**

This study selected three groups: two experimental groups and one control group. The researchers took a homogeneity test (KET) to assess students at the same level. Students in three groups took a pre-test of vocabulary and pronunciation to evaluate their level before administering

the treatments. The groups received instruction during eight sessions, and each session lasted 20 minutes.

The teacher started the instruction of the first experimental group by showing picture stories based on minimal pairs. At the same time, the teacher told the story based on these pictures. The teacher worked on new minimal-pair words and their pronunciation through these pictures. The teacher concentrated on minimal pairs by raising her intonation to attract the students' attention. The teacher wrote minimal pairs on the board and practiced them with students. For the interaction among students, the teacher grouped them to talk about the story and used minimal pairs. Therefore, in this group, the teacher used pictorial minimal pair-based stories to teach the words and their correct pronunciation. In the second experimental group, all aspects of the instruction were similar to those of the previous group, with the notable difference being the absence of pictures. The students received instruction based on a minimal-pair story without pictures. In the control group, the teacher taught the control new words without using minimal pair- or picture-based stories. Teachers wrote all words on the board for repetition.

Then, the teacher administered two post-tests to check the effects of the treatment. The first post-test evaluated their pronunciation skills, while the second post-test concentrated on evaluating their vocabulary recall. The researchers designed these two post-tests and obtained their reliability during the pilot study before administrating the tests.

The immediate post-test is administered shortly after the participants have completed the instruction. This test considered their pronunciation skills immediately after they had received instruction. The teacher interviewed the students to assess their pronunciation accuracy. This interview included three questions that focused solely on evaluating their pronunciation. In each

session, the teacher interviewed the students immediately after the instruction. After eight sessions, they answered 24 questions to assess pronunciation accuracy.

On the other hand, the delayed post-test was administered after 10 days to assess their vocabulary retention. The study estimated the participants' language abilities by conducting immediate and delayed post-tests. The immediate post-test evaluated their immediate progress in improving pronunciation skills. On the other hand, the delayed post-test provided insights into their long-term retention and application of the vocabulary learned.

## Results

To test the hypotheses mentioned above, the researchers investigated the preliminary analysis first. It included the homogeneity of the groups, descriptive statistics, and assumptions for ANOVA.

### Preliminary Analysis

In the current study, the researcher utilized the Cambridge Key English Test (KET) to homogenize three distinct participant groups, ensuring a consistent baseline of language proficiency. Then, the researcher entered the data into SPSS 26 and ran ANOVA. According to Pallant (2007), the Levene's test for homogeneity of variances examines whether the variance in scores is the same for each group. If the significant value (Sig.) for Levene's test is greater than .05, the groups are homogeneous. As Table 1 indicates, the Sig value is .96 > .05, showing that the three groups are homogeneous.

**Table 1**

*Test of Homogeneity of Variances*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| score | Based on Mean | .032 | 2 | 42 | .969 |
| | Based on Median | .038 | 2 | 42 | .963 |
| | Based on Median and with adjusted df | .038 | 2 | 40.786 | .963 |
| | Based on trimmed mean | .031 | 2 | 42 | .970 |

In this study, the researcher used One-way ANOVA to analyze the data. Before conducting this statistical procedures, the researcher investigated the descriptive analysis and the assumptions for One-way ANOVA, including normality and equal variances (Pallant, 2007).

The researcher employed descriptive analysis to demonstrate no abnormality in the data distribution, such as kurtosis or skewness. Table 2 shows the outcomes of descriptive statistics for the researcher-made pronunciation and vocabulary tests. The mean score obtained by EFL learners on the pronunciation test was 15.07 and for the vocabulary test 17.38. Moreover, comparing the Mean and Trimmed Mean for EFL learners showed a distinct similarity between these values. Therefore, these cases were considered in the data file for further analysis (Pallant, 2007). Additionally, Table 4 provides information on the standard deviation of the survey data collected for the pronunciation and vocabulary tests.

**Table 2**

*Descriptive Statistics for the EFL Learners Regarding Pronunciation and Vocabulary Tests*

| | | | Statistic | Std. Error |
|---|---|---|---|---|
| Pronunciation | Mean | | 15.0709 | .50933 |
| | 95% Confidence Interval for Mean | Lower Bound | 14.0444 | |
| | | Upper Bound | 16.0974 | |
| | 5% Trimmed Mean | | 15.2384 | |
| | Median | | 15.8300 | |
| | Variance | | 11.674 | |
| | Std. Deviation | | 3.41666 | |
| | Range | | 13.34 | |
| | Interquartile Range | | 5.83 | |
| | Skewness | | -.660 | .354 |

| | | | | |
|---|---|---|---|---|
| | Kurtosis | | .015 | .695 |
| Vocabulary | Mean | | 17.3831 | .31370 |
| | 95% Confidence Interval for Mean | Lower Bound | 16.7509 | |
| | | Upper Bound | 18.0153 | |
| | 5% Trimmed Mean | | 17.5361 | |
| | Median | | 18.1800 | |
| | Variance | | 4.428 | |
| | Std. Deviation | | 2.10436 | |
| | Range | | 9.10 | |
| | Interquartile Range | | 2.60 | |
| | Skewness | | -1.080 | .354 |
| | Kurtosis | | 1.103 | .695 |

Table 3 displays the findings of the Kolmogorov-Smirnov statistics, which aimed to evaluate the normality of the score distribution for EFL learners. The Sig. value is .056 for pronunciation test and .051 for the vocabulary test, indicating a normal distribution (Pallant, 2007).

**Table 3**

*K-S Tests of Normality*

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Pronunciation | .136 | 45 | .056 | .944 | 45 | .051 |
| Vocabulary | .190 | 45 | .062 | .901 | 45 | .058 |

a. Lilliefors Significance Correction

The boxplots indicating a normal distribution support the assumption of homogeneity of variance. According to Pallant (2007), a reasonably straight line on the Q-Q plot reveals a normal distribution. Based on these findings, it appears that the assumptions of homogeneity of variance and normality have been met, allowing for the possibility of conducting One-way ANOVA.

## Reliability of Researcher-Made Pronunciation and Vocabulary Tests

The researcher conducted a pilot study to examine the reliability of the researcher-made pronunciation and vocabulary tests. Reliability refers to the consistency of a measuring instrument when used repeatedly under similar conditions with the same group of subjects, as highlighted by

Carson et al. (2005). Essentially, it reflects the stability of results across repeated measurements of a scale. In this research, the researcher employed test-retest reliability to assess the consistency of scores from a test taken by the same individual on two different occasions (Hays et al., 1993). Using SPSS 26, the researcher calculated the Pearson correlation coefficient to evaluate the reliability of researcher-made pronunciation and vocabulary tests through test-retest reliability. The correlation between the scores from the first and second administrations of these tests, which were conducted two weeks apart, was found to be r = 0.74 for pronunciation test and r = 0.87 for vocabulary test, $p < .05$. This indicates a strong positive correlation and suggests good test-retest reliability. Tables 4 and 5 summarize the findings of this section.

**Table 4**

*The Correlation Between Scores on the First and Second Administrations of the Researcher-Made Pronunciation Test*

| | | Pronuciation1 | Pronuciation2 |
|---|---|---|---|
| Pronunciation1 | Pearson Correlation | 1 | .746* |
| | Sig. (2-tailed) | | .013 |
| | N | 10 | 10 |
| Pronunciation2 | Pearson Correlation | .746* | 1 |
| | Sig. (2-tailed) | .013 | |
| | N | 10 | 10 |

*. Correlation is significant at the 0.05 level (2-tailed).

**Table 5**

*The Correlation between Scores on the First and Second Administrations of the Researcher-Made Vocabulary Test*

| | | Vocbulary1 | Vocabulary2 |
|---|---|---|---|
| Vocabulary1 | Pearson Correlation | 1 | .872** |
| | Sig. (2-tailed) | | .001 |
| | N | 10 | 10 |
| Vocabulary2 | Pearson Correlation | .872** | 1 |
| | Sig. (2-tailed) | .001 | |
| | N | 10 | 10 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Analysis for Research Question One**

In the first research question, the researcher investigated the extent to which the pictorial minimal pair-based stories have a significant effect on EFL beginners' pronunciation accuracy. To this end, the researcher used a one-way between-groups analysis of variance (ANOVA). The researcher divided the participants into three groups: the control group who did not receive the treatment; the first experimental group who received treatment with stories, pictorial minimal pairs, and pictures; and the second experimental group who received treatment with stories and pictorial minimal pairs without pictures. The results showed a significant difference in Pronunciation scores for the three groups at a $p < .05$ level, with $F\ (2,42) = 5.483$ and $p = .008$ (Table 6).

**Table 6**
*ANOVA Results for Pronunciation Test Regarding Groups*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 106.346 | 2 | 53.173 | 5.483 | .008 |
| Within Groups | 407.290 | 42 | 9.697 | | |
| Total | 513.636 | 44 | | | |

The results of the multiple comparisons conducted in Table 7 indicate which groups had significant differences. When conducting post hoc tests on a one-way ANOVA, the Tukey post hoc test is the preferred method. The Tukey HSD test revealed that Control Group (M = 12.94, SD = 4.24) had a significantly different mean score compared to Experimental Group 1 (M = 16.46, SD = 2.64), and Experimental Group2 (M = 15.70, SD = 1.88). Additionally, control group's mean score was significantly different from experimental group 1. Therefore, experimental group 1 outperformed the control group.

However, there was no significant difference between control group and experimental group 2 (p = .06). While there is a difference in means, it is not statistically significant at the .05 level. This suggest that the treatment in experimental group 2 may not be as effective as the treatment in experimental group 1. Moreover, there was no significant difference between experimental groups 1 and 2 (p = .06), indicating that both treatments had similar effects on pronunciation accuracy. Tables 7 and 8 provide the complete results of this analysis.

**Table 7**

*Descriptive Statistics for Pronunciation Test Regarding Control and Experimental Groups*

| | N | Mean | Std. Dev. | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Control | 15 | 12.9413 | 4.24718 | 1.09662 | 10.5893 | 15.2933 |
| Experimental 1 | 17 | 16.4671 | 2.64517 | .64155 | 15.1070 | 17.8271 |
| Experimental 2 | 13 | 15.7023 | 1.88855 | .52379 | 14.5611 | 16.8435 |
| Total | 45 | 15.0709 | 3.41666 | .50933 | 14.0444 | 16.0974 |

**Table 8**

*Multiple Comparison of Control and Experimental Groups for the Pronunciation Test*

| (I) Groups | (J) Groups | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Control | Experimental 1 | -3.52573* | 1.10314 | .007 | -6.2058 | -.8456 |
| | Experimental 2 | -2.76097 | 1.18002 | .061 | -5.6278 | .1059 |
| Experimental 1 | Control | 3.52573* | 1.10314 | .007 | .8456 | 6.2058 |
| | Experimental 2 | .76475 | 1.14734 | .784 | -2.0227 | 3.5522 |
| Experimental 2 | Control | 2.76097 | 1.18002 | .061 | -.1059 | 5.6278 |
| | Experimental 1 | -.76475 | 1.14734 | .784 | -3.5522 | 2.0227 |

*. The mean difference is significant at the 0.05 level.

Consequently, the findings of question one revealed that the type of treatment has a significant effect on pronunciation accuracy among EFL beginners. The use of pictorial minimal pairs combined with stories and pictures (experimental group 1) led to significantly better pronunciation scores compared to the control group. However, there was no significant difference between the

control group and experimental group 2 or between the two experimental groups, suggesting that while visual aids enhance learning, their absence does not drastically hinder performance compared to no treatment at all.

**Analysis for Research Question Two**

In the second research question, the researcher investigated the extent to which the pictorial minimal pair-based stories have a significant effect on EFL beginners 'Vocabulary' accuracy. To answer this question, the researcher employed a one-way between-groups analysis of variance (ANOVA). The researcher allocated the participants into three groups: the control group with no treatment; the first experimental group with stories, pictorial minimal pairs, and pictures; and the second experimental group with stories and pictorial minimal pairs without pictures. The results indicated no significant difference in Vocabulary scores for the three groups at a $p < .05$ level, with $F\ (2,42) = 1.169$ and $p = 0.321$ (Table 9).

**Table 9**
*ANOVA Results for Vocabulary Test Regarding Groups*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 1327.116 | 2 | 663.558 | 1.169 | .321 |
| Within Groups | 23844.858 | 42 | 567.735 | | |
| Total | 25171.973 | 44 | | | |

The results of the multiple comparisons conducted in Table 10 indicate which groups had significant differences. The Tukey HSD test showed that Control Group (M = 17.04, SD = 2.73, p = .000) had a different mean score compared to Experimental Group 1 (M = 18.01, SD = 1.98, p = .000), and Experimental Group2 (M = 29.50, SD = 44.41, p = .000). Although experimental group 1 had a higher mean score than the control group, the differences were not statistically

significant (p = .99). Furthermore, the control group's mean score was not significantly different from the experimental group 2 (p = .36). Table12 and 13 provide the complete results of this analysis.

**Table 10**

*Descriptive Statistics for Vocabulary Test Regarding Control and Experimental Groups*

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Control | 15 | 17.0407 | 2.73094 | .70512 | 15.5283 | 18.5530 |
| Experimental1 | 17 | 18.0194 | 1.98943 | .48251 | 16.9965 | 19.0423 |
| Experimental2 | 13 | 29.5077 | 44.41952 | 12.31976 | 2.6652 | 56.3501 |
| Total | 45 | 21.0120 | 23.91841 | 3.56555 | 13.8261 | 28.1979 |

**Table 11**

*Multiple Comparisons of Control and Experimental Groups for the Vocabulary Test*

| (I)Groups | (J) Groups | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval Lower Bound | Upper Bound |
|---|---|---|---|---|---|---|
| Control | Experimental 1 | -.97875 | 8.44068 | .993 | -21.4853 | 19.5278 |
| | Experimental 2 | -12.46703 | 9.02889 | .360 | -34.4027 | 9.4686 |
| Experimental 1 | Control | .97875 | 8.44068 | .993 | -19.5278 | 21.4853 |
| | Experimental 2 | -11.48828 | 8.77884 | .398 | -32.8164 | 9.8399 |
| Experimental 2 | Control | 12.46703 | 9.02889 | .360 | -9.4686 | 34.4027 |
| | Experimental 1 | 11.48828 | 8.77884 | .398 | -9.8399 | 32.8164 |

The findings of question two suggest that while there are differences in mean vocabulary scores among the groups, these differences are not statistically significant at the .05 level. The treatment involving pictorial minimal pairs and stories did not show a clear advantage over no treatment in terms of vocabulary accuracy for EFL beginners. This might indicate that other factors could be influencing vocabulary acquisition or that the treatments did not sufficiently engage learners or provide effective strategies for improving vocabulary accuracy.

## Discussion

The primary aim of this study was to investigate the effectiveness of pictorial minimal pair-based stories in enhancing pronunciation and vocabulary accuracy among EFL beginners. The result of question one revealed that using pictorial minimal pairs with stories and pictures led to significantly better pronunciation scores than the control group. The findings of the current study align with those of Hamzeh and Bawodood (2019), who examined the effectiveness of minimal pairs in enhancing the pronunciation of English consonants among Yemeni EFL learners. Their research utilized a pretest-posttest quasi-experimental design involving ten male undergraduate students in an experimental group. Over a five-week intervention period, participants engaged in drills focusing on minimal pairs. The results revealed a notable improvement in the pronunciation of challenging English sounds, as evidenced by a reduction in pronunciation difficulties from pre-test to post-test scores.

Moreover, the findings of this study were in line by Rakat et al. (2024). They investigated the effect of minimal pairs on students' pronunciation mastery at the eleventh grade of SMA Nur El Falah. They used pre- and post-test, recording, and documenting to collect the data. The findings indicated that minimal pairs were effective towards students' pronunciation mastery at the eleventh grade.

The results from question two indicate that although there are variations in mean vocabulary scores across the groups, these differences do not reach statistical significance at the .05 level. The intervention that utilized pictorial minimal pairs and stories did not demonstrate a distinct benefit over the control group regarding vocabulary accuracy for beginner EFL learners. Conversely, the results of the present study differ from those reported by Kadaryanto and Handayani (2011), who explored vocabulary instruction through pictured stories. Their findings revealed a significant

enhancement in students' vocabulary achievement when utilizing pictured stories. The lack of significant vocabulary gains in the present study suggests that while pictorial minimal pairs may aid pronunciation, they might not be as effective for vocabulary acquisition. This discrepancy could be attributed to differences in study design, participant demographics, or the specific instructional methods employed.

Further supporting the potential of visual aids in language learning, Hashemifardnia et al. (2018) demonstrated that using picture-books significantly improved vocabulary learning among Iranian elementary EFL learners. Their findings align with the principles of Dual Coding Theory, as explored by Yanasugondha (2017), who found that simultaneous L2 to L1 translation and pictorial coding enhanced both immediate and long-term vocabulary retention among Thai EFL students. These studies collectively highlight the benefits of integrating visual elements into language instruction, particularly for vocabulary learning.

In contrast, the current study's findings on pronunciation accuracy are consistent with those of Haghighi and Rahimi (2017), who reported that L2 minimal pairs practice significantly improved pronunciation accuracy among Iranian intermediate EFL learners. Both studies emphasize the effectiveness of minimal pairs in pronunciation training, suggesting that this approach can be beneficial across different proficiency levels.

The study's findings propose that integrating visual aids like pictures into pronunciation instruction for EFL beginners can significantly improve their accuracy. This implication calls educators to explore and utilize visual resources like pictorial minimal pairs with stories to enhance pronunciation learning. While visual aids impacted positively pronunciation, the lack of a significant effect on vocabulary acquisition highlights the need for engaging and effective strategies for vocabulary learning.

The results indicate that the absence of visual aids did not hinder performance compared to no treatment. It implies that different learners might benefit from diverse approaches, and a more personalized approach to instruction, considering individual learning styles and needs, might be more effective. Therefore, teachers should be more flexible and adapt their teaching methods to cater to individual learning styles and needs. Moreover, the study provides valuable insights into the effectiveness of pictorial minimal pair-based stories for EFL beginners. It emphasizes the potential of visual aids in pronunciation instruction and highlights the importance of exploring effective strategies for vocabulary development.

In addition, policy makers can allocate resources for teacher training programs that equip teachers with the knowledge and skills to effectively utilize visual aids and implement engaging vocabulary learning strategies. They can ensure that educational institutions provide access to appropriate visual resources like pictures, videos, and online tools that can be integrated into language learning materials. Consequently, they can support research initiatives that investigate the effectiveness of different language learning approaches and promote the adoption of evidence-based practices in language education.

On the other hand, curriculum developers can incorporate visual aids, particularly pictorial minimal pairs, into language learning materials, especially for pronunciation instruction. Also, they can focus on developing curricula that incorporate a variety of interactive activities, games, and real-world applications that promote active vocabulary learning.

## Conclusions

The purpose of the present study was to explore the influence of pictorial minimal pair-based stories on EFL beginners' pronunciation accuracy and vocabulary recall. The analysis indicated

that the type of treatment significantly affected pronunciation accuracy. The group employing pictorial minimal pairs with stories and pictures achieved significantly higher pronunciation scores than the control group. Nevertheless, there were no significant differences between the control group and the group using stories and pictorial minimal pairs without pictures or between the two experimental groups. This indicates that visual aids enhanced pronunciation learning, but their absence did not significantly hinder performance compared to no treatment.

In conclusion, the study emphasizes the significant role of pictorial minimal pair-based stories in enhancing pronunciation accuracy among EFL beginners, aligning with previous research on the effectiveness of minimal pairs in pronunciation training. However, the findings also highlight a discrepancy in vocabulary acquisition, suggesting that while visual aids are beneficial, their impact may vary depending on the instructional context and learner demographics. These insights contribute to a nuanced understanding of the use of visual elements in language learning, advocating for a tailored approach that considers the specific needs and characteristics of learners to maximize educational outcomes.

The study has several limitations that may influence the interpretation of its findings. Firstly, the small sample size and the narrow age range of the participants limit the generalizability of the results. Moreover, the eight-session duration of the intervention may not be adequate to evaluate long-term effects on vocabulary recall. Also, the use of researcher-made tests raises concerns about standardization and reliability. Besides, this study did not control the potential variables, including individual learner differences and classroom dynamics.

There are some suggestions for further research based on the findings of this research. Since the treatment did not significantly impact vocabulary accuracy, future research should delve deeper into the factors influencing vocabulary acquisition. Moreover, the study focused on pictures as

visual aids. Further research could examine the effectiveness of other visual tools like videos, animations, or interactive online platforms in enhancing vocabulary learning. The current study examined short-term effects. It would be valuable to conduct a longitudinal study to assess the long-term impact of pictorial minimal pair-based stories on pronunciation and vocabulary development. On the other hand, future research could examine the potential influence of this approach on other language skills like listening comprehension, reading comprehension, and writing. Additionally, the present study focused on EFL beginners. Future research could investigate the effectiveness of this approach for learners at different proficiency levels. Also, further research could explore the potential of technology-enhanced learning platforms to incorporate pictorial minimal pairs and stories for pronunciation and vocabulary acquisition.

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