



MODELLING TEACHING VOCABULARY MASTERY BY GAME- BASED LEARNING APPROACH

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ABSTRACT

This study investigates the effectiveness of game-based learning strategies in enhancing the vocabulary proficiency of eighth-grade junior high school students. Specifically, it examines and compares the impact of the Word Chain Game, Mnemonic Technique, and Jumble Word Game on students' vocabulary acquisition and retention. A quantitative methodology was employed, utilizing experimental and quasi-experimental designs across three junior high schools. Participants were selected through random sampling in three separate studies. The Word Chain Game study involved 61 students, the Mnemonic Technique study included 56 students, and the Jumble Word Game study consisted of 60 students, each divided into experimental and control groups. Data were gathered through multiple-choice pre-tests and post-tests and analyzed using t-tests with SPSS software. The findings revealed that all three instructional approaches significantly improved students' vocabulary mastery. The Word Chain Game demonstrated the strongest effect ($t = 6.463$), followed by the Mnemonic Technique ($t = 5.667$) and the Jumble Word Game ($t = 3.020$). These results indicate that game-based learning promotes greater engagement and strengthens vocabulary retention. The novelty of this study lies in its integrative analysis of three distinct vocabulary-learning interventions, providing comprehensive evidence that interactive and game-oriented strategies effectively support vocabulary development among junior high school learners.

Keywords: *Game-based learning, vocabulary mastery, word chain game, mnemonic technique, jumble word game*

1. INTRODUCTION

Vocabulary constitutes a fundamental element of English language learning, as it underpins learners' abilities in the four primary language skills: listening, speaking, reading, and writing (Nation, 2022; Thornbury, 2023). Insufficient vocabulary knowledge frequently hinders students from comprehending information, conveying ideas effectively, and engaging in meaningful communication. Consequently, vocabulary mastery is widely recognized as a crucial factor in achieving successful language acquisition and communicative competence (Maharani, 2023). To facilitate effective vocabulary development, English teachers

are encouraged to employ engaging and interactive instructional strategies that foster students' motivation, participation, and active involvement throughout the learning process (Thi & Que, 2025; Harmer, 2017; Parhadjanovna, 2023).

However, many students still experience problems in mastering vocabulary. Based on interviews conducted at SMP Negeri 6 Padangsidempuan, SMP N 1 Batang Angkola, and SMP Negeri 8 Padangsidempuan, students had difficulties memorizing vocabulary, pronouncing words, understanding meanings, and distinguishing parts of speech (Yang et al., 2024). Students also felt bored because teachers commonly

used traditional and monotonous teaching methods such as memorization and dictionary activities. These conditions reduced students' interest and participation in English learning (Anwar, 2018).

To overcome these problems, teachers need to apply creative and enjoyable learning strategies. One effective approach is game-based learning because games can create an active, motivating, and interactive classroom atmosphere (de Carvalho & Coelho, 2022). Game-based learning encourages students to participate directly in learning activities while improving their vocabulary retention and understanding (Asad et al., 2021). In this study, the researcher focuses on three learning techniques, namely Word Chain Game, Mnemonic Technique, and Jumble Word Game, as alternative approaches to improve students' vocabulary mastery.

Word Chain Game helps students develop vocabulary through cooperative word activities by connecting words using the last letter of previous words (Lewis, 2007). Mnemonic Technique assists students in remembering vocabulary more easily through memory strategies and associations (Darusman & Herwina, 2018). Meanwhile, Jumble Word Game trains students to arrange random letters into meaningful words, helping them improve spelling and word recognition (Hidayati, 2021). These techniques are considered suitable for junior high school students because they combine learning activities with enjoyable classroom interaction (Philip, 2020).

Several previous studies have investigated vocabulary learning techniques independently. However, limited studies have integrated findings from different vocabulary learning strategies into a single study. Therefore, this article aims to synthesize and discuss the findings of three experimental studies on the use of the Word Chain Game, Mnemonic Technique, and Jumble Word Game in improving students'

vocabulary mastery at the junior high school level.

2. LITERATURE REVIEW

Vocabulary is one of the most important components in language learning because it supports students' ability in listening, speaking, reading, and writing. Vocabulary knowledge is essential for learners to understand and produce language effectively in both oral and written communication. Richards & Renandya (2002) state that vocabulary is a core component of language proficiency and provides the basis for how learners speak, listen, read, and write. Similarly, Nunan (2023) explains that vocabulary refers to the words used in a target language. According to Ur (2012), vocabulary is a list of words and can be defined as the total number of words known or understood by a particular person. Vocabulary mastery refers to students' ability to understand, remember, pronounce, spell, and use words appropriately in communication. Students who master vocabulary can express ideas effectively in both spoken and written language. Therefore, vocabulary mastery plays a significant role in helping students communicate and develop their English skills.

Game-based learning is an interactive learning approach that combines educational material with enjoyable activities to increase students' motivation and participation during the learning process. Games are considered effective in language learning because they create active, challenging, and enjoyable classroom situations while helping students improve vocabulary mastery (Pelangi et al., 2025). In this study, the researcher focuses on three game-based learning techniques, namely Word Chain Game, Mnemonic Technique, and Jumble Word Game.

Word Chain Game is a vocabulary game in which students mention words beginning with the last letter of the previous

word (Abbas, 2010). This game helps students improve vocabulary mastery, spelling, cooperation, and active participation in learning activities. Meanwhile, Mnemonic Technique is a memory strategy that helps students remember vocabulary more easily by connecting words, ideas, images, or associations (Kit et al., 2024). This technique supports students in transferring information from short-term memory into long-term memory. In addition, Jumble Word Game is a word arrangement activity where students rearrange random letters into meaningful words (Sabila, 2020). This game helps students improve spelling ability, vocabulary recognition, creativity, and learning motivation.

These techniques are considered suitable for vocabulary learning because they provide enjoyable, interactive, and student-centered learning experiences. Through game-based learning, students become more active and interested in learning vocabulary, while teachers can create a less monotonous and more effective classroom atmosphere.

Several previous studies have discussed the use of game-based learning techniques in improving students' vocabulary mastery. Previous researchers found that interactive games and mnemonic strategies significantly helped students improve vocabulary understanding, spelling, pronunciation, and memory retention during English learning activities.

Studies on Word Chain Game showed positive effects on students' vocabulary mastery. Medina et al. (2021), Nufus (2019), and Amaliyah (2020) found that students taught using Word Chain Game achieved higher post-test scores than students taught using conventional methods. The findings revealed that Word Chain Game increased students' participation, cooperation, vocabulary recognition, and learning motivation. Statistical analyses from those studies also confirmed significant improvements in students' vocabulary

achievement after the implementation of the game.

Research related to Mnemonic Technique also demonstrated significant results in vocabulary learning. Marthila (2020), Hadiwijaya (2020), Auliya (2023), and Fahmi (2023) found that mnemonic strategies effectively improved students' ability to remember and understand vocabulary. The studies reported that students who learned vocabulary through mnemonic techniques obtained better vocabulary scores than those taught without mnemonic strategies. Mnemonic learning was considered effective because it helped students connect words with images, associations, and memory patterns that supported long-term retention.

Furthermore, several studies investigated the effectiveness of Jumble Word Game in vocabulary learning. Sitompul and Manik (2023), Lubis (2021), and Umasugi et al. (2018) reported that Jumble Word Game significantly improved students' vocabulary mastery. The studies showed that students became more active, motivated, and interested in learning vocabulary through word arrangement activities. Jumble Word Game also helped students improve spelling accuracy, word recognition, and vocabulary memorization in enjoyable learning situations.

Based on previous studies, it can be concluded that Word Chain Game, Mnemonic Technique, and Jumble Word Game positively affect students' vocabulary mastery. However, previous research has generally investigated each technique independently. Therefore, this study reports and synthesizes findings from three separate studies to provide broader insights into the use of vocabulary learning techniques for improving vocabulary mastery among junior high school students.

3. METHODS

This study employed a quantitative approach using a true experimental design

with a pretest-posttest control group design. The research was conducted at SMP Negeri 6 Padangsidempuan, SMP Negeri 1 Batang Angkola, and SMP Negeri 8 Padangsidempuan from 2023 to 2025. The study aims to determine the effect of the Word Chain Game, mnemonic technique, and Jumble Word Game on students' vocabulary mastery. Each study involved two classes: an experimental class that received the treatment and a control class taught using conventional methods (Creswell & Creswell, 2018).

The study population consisted of all eighth-grade students from the three schools, totaling 468 students. The samples were selected using random sampling techniques in three different studies. The Word Chain Game study involved 61 students, the Mnemonic Technique study involved 56 students, and the Jumble Word Game study involved 60 students, each with an experimental and a control group. The research instruments consisted of multiple-choice tests in the form of pre-tests and post-tests to measure students' vocabulary mastery. The instruments were tested for validity using the Pearson Product Moment correlation and for reliability using Cronbach's Alpha via SPSS.

The research procedure included a pre-test, treatment, and post-test. The experimental class received instruction using the Word Chain Game, mnemonic technique, and Jumble Word Game, while the control class used conventional instruction. Data were analyzed using normality tests, homogeneity tests, and independent sample t-tests to determine the effect of the treatment on students' vocabulary mastery.

4. RESULTS AND DISCUSSION

Word Chain Game

Before the treatment, a pre-test was administered to both the experimental and

control classes to measure students' initial vocabulary mastery. The experimental class obtained a mean score of 59, with the highest score of 75 and the lowest score of 45. Meanwhile, the control class obtained a mean score of 53.06, with the highest score of 65 and the lowest score of 30. These results indicated that students' vocabulary mastery was still relatively low before the treatment.

After the implementation of the Word Chain Game, the post-test results showed improvement in both classes. The experimental class achieved a mean score of 70.33, with the highest score of 95 and the lowest score of 50. Meanwhile, the control class obtained a mean score of 62.58, with the highest score of 90 and the lowest score of 35. The improvement in the experimental class was higher than that of the control class, indicating that the Word Chain Game contributed positively to students' vocabulary mastery.

The normality test using Kolmogorov-Smirnov showed that all significance values were higher than 0.05, indicating that the data were normally distributed. In addition, the homogeneity test showed a significance value of 0.065, which means that the variances were homogeneous.

The hypothesis test using an independent sample t-test showed that the t-count was higher than the t-table ($6.463 > 2.000$). Therefore, the alternative hypothesis was accepted, indicating that the Word Chain Game had a significant effect on students' vocabulary mastery at the eighth grade students of SMP Negeri 6 Padangsidempuan. The gain score analysis also showed that the experimental class achieved better improvement than the control class, with a gain score of 0.75.

Mnemonic Technique

Before the treatment, a pre-test was administered to both the experimental and control classes to measure students' initial vocabulary mastery. The experimental class, VIII-E, obtained a total score of 1,790 with a mean score of 63.93. The highest score was

95, while the lowest score was 35. In addition, the median score was 65, the mode was 65, the variance was 97.189, and the standard deviation was 9.858. Meanwhile, the control class, VIII-A, obtained a total score of 1,710 with a mean score of 61.07. The highest score was 90, while the lowest score was 25. The median score was 62.50, the mode was 80, the variance was 130.952, and the standard deviation was 11.443.

Based on the pre-test results, both classes still showed relatively low vocabulary mastery before the implementation of the mnemonic technique. However, the experimental class achieved a slightly higher mean score than the control class.

After the treatment, a post-test was administered to both classes to measure students' vocabulary mastery after the implementation of the mnemonic technique. The experimental class, VIII-E, obtained a total score of 2,455 with a mean score of 87.68. The highest score was 100, while the lowest score was 60. In addition, the median score was 90, the mode was 95, the variance was 398.810, and the standard deviation was 19.710.

Meanwhile, the control class, VIII-A, obtained a total score of 2,360 with a mean score of 84.29. The highest score was 100, while the lowest score was 55. The median score was 85, the variance was 304.365, and the standard deviation was 17.446.

Based on the post-test results, both classes showed improvement in vocabulary mastery after the learning process. However, the experimental class achieved a higher mean score than the control class, indicating that the mnemonic technique gave a positive effect on students' vocabulary mastery.

The normality test showed that all data were normally distributed, while the homogeneity test indicated that the variances were homogeneous. Furthermore, the hypothesis test using an independent sample t-test showed that the t-count was 5.667. Based on the hypothesis criteria, the hypothesis is accepted if $t\text{-count} \geq t\text{-table}$.

Since the t-count was higher than the t-table, the alternative hypothesis (H_a) was accepted and the null hypothesis (H_0) was rejected. It means that the mnemonic technique had a significant effect on students' vocabulary mastery.

Jumble Word Game

Before the treatment, a pre-test was administered to both the experimental and control classes to measure students' initial vocabulary mastery. The experimental class (VIII-1) obtained a mean score of 56.73, while the control class (VIII-4) obtained a mean score of 55.67. These results indicate that both classes had relatively similar vocabulary mastery before the treatment.

After the implementation of the Jumble Word Game, the post-test results showed improvement in both classes. The experimental class achieved a mean score of 80.07, while the control class obtained 73.87. The improvement in the experimental class was higher than in the control class, indicating that the Jumble Word Game positively affected students' vocabulary mastery.

The normality test using Kolmogorov-Smirnov showed that all significance values were higher than 0.05, indicating that the data were normally distributed. The homogeneity test also showed a significance value of 0.089, which means the data were homogeneous.

Furthermore, the independent sample t-test showed that the t-count was higher than the t-table ($3.020 > 1.671$). Therefore, the alternative hypothesis (H_a) was accepted and the null hypothesis (H_0) was rejected. It can be concluded that the Jumble Word Game had a significant effect on students' vocabulary mastery at the eighth grade students of SMP Negeri 8 Padangsidempuan.

In addition, the gain score analysis showed that the experimental class improved from 56.73 to 80.07, while the control class improved from 55.67 to 73.87. These findings indicate that the Jumble Word Game effectively improved students' vocabulary mastery.

Discussion

The results of the study indicate that the use of interactive vocabulary learning techniques, namely the Word Chain Game, the Mnemonic Technique, and the Jumble Word Game, has a positive effect on students' vocabulary mastery. All three techniques showed an increase in post-test scores compared to pre-test scores, suggesting that active and engaging learning activities can help students better understand and remember English vocabulary. A comparison of the results obtained from the three techniques is presented in Table 1.

Table 1. Comparison of Students' Vocabulary Mastery Results in Word Chain Game, Mnemonic Technique, and Jumble Word Game

Tech nique	Ex Pre	Ex Post	Contrl Pre	Contrl Post	t-count	Result
WCG	59.00	70.33	53.06	62.58	6.463	Significant
MT	63.93	87.68	61.07	84.29	5.667	Significant
JWG	56.73	80.07	55.67	73.87	3.020	Significant

The improvement in students' vocabulary mastery supports previous theories stating that game-based and memory-based learning strategies can help students store and recall vocabulary more effectively. The Word Chain Game helps students connect one word to another, making them more active in practicing vocabulary and spelling. Meanwhile, the Mnemonic Technique helps students remember vocabulary through associations and memory cues, while the Jumble Word Game trains students to recognize and arrange words correctly. These findings align with the theory proposed by Lewis (2007), Anwar (2018), and Philip (2020), which states that interactive learning techniques can improve students' vocabulary mastery.

Furthermore, the results of this study are supported by several previous studies conducted by Gultom (2018), Sitepu (2018), Wahyuningsih (2020), Siagian (2020), Risa S (2020), Bambang (2022), and Sitompul & Manik (2023), which indicate that the use of interactive learning techniques leads to a significant improvement in students' vocabulary mastery. Although there are

differences in results across each study, all studies demonstrate a positive impact on students' vocabulary skills.

Differences in the level of improvement in learning outcomes among the three techniques may be influenced by several factors, such as the sample size, student characteristics, the vocabulary material used, and the implementation process of the techniques in the classroom. The Mnemonic Technique showed a relatively higher average improvement compared to the other techniques because this technique helps students remember vocabulary through associations of meaning and memory. Meanwhile, game-based techniques such as the Word Chain Game and Jumble Word Game encourage greater engagement, participation, and a fun learning atmosphere, making students more interested in the vocabulary learning process.

Thus, it can be concluded that the use of interactive vocabulary learning strategies is effective in improving students' vocabulary mastery. These techniques not only help students understand and remember vocabulary better but also create a more active, engaging, and enjoyable learning process in the classroom.

5. CONCLUSION

Based on the results of the study, it can be concluded that interactive vocabulary learning techniques, namely Word Chain Game, Mnemonic Technique, and Jumble Word Game, had a significant positive effect on students' vocabulary mastery. Before the implementation of the techniques, students' vocabulary achievement was still relatively low, as indicated by the pre-test scores in each study. However, after the treatments were applied, students' post-test scores improved significantly, showing better vocabulary mastery compared to conventional learning methods.

The findings also revealed that all techniques contributed to improving students' ability to remember, understand, and use

English vocabulary more effectively. Mnemonic Technique helped students strengthen memory and recall, while Word Chain Game and Jumble Word Game encouraged active participation and engagement during the learning process. In addition, the statistical analysis from all studies showed that the t-count values were higher than the t-table values, indicating that the alternative hypothesis (Ha) was accepted.

Therefore, it can be concluded that interactive and engaging learning techniques are effective strategies for improving students' vocabulary mastery and can be implemented as alternative methods in English language learning, especially at the junior high school level.

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