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The Use of the Tic-Tac-Toe Game-Based Learning on Students' Vocabulary Mastery

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ABSTRACT

The research aimed to analyze improvements in English vocabulary mastery among eighth-grade students through game-based learning using the Tic-Tac-Toe. One of the fundamental elements in learning the target language, English as a Foreign Language (EFL), is vocabulary, but quite often junior high school students are not able to identify words by their meanings or word classes, or even use them properly in simple communicative contexts. This research used a one–group pre–test–post–test design involving 30 VIII students from a Junior High School in Gowa Regency, Indonesia. The rationale for selecting these participants is based on preliminary classroom observations indicating that these students need extra assistance with vocabulary acquisition. A teacher-made vocabulary test consisting of multiple-choice and fill-in-the-blank vocabulary assessment was administered prior to the start of and following 6 Tic-Tac-Toe meetings. The intervention only included nouns, verbs, and adjectives from words referring to topics with which students already had some familiarity. The results showed that the overall mean score increased from 34.50 on the pre-test to 80.50 on the post-test, with gains that take on greater meaning when examining nouns, verbs, and adjectives, respectively. At the level, the t-test value (5.51) was greater than the t-table value (2.045). 05 significance level, suggesting a statistically sound improvement. This analysis demonstrates that Tic-Tac-Toe can serve as an affordable and interactive classroom strategy to reinforce vocabulary mastery, especially when teachers are seeking non-digitally dependent, offline learning activities.

Keywords: EFL Vocabulary; Game-Based Learning; Tic-Tac-Toe; Vocabulary Mastery

INTRODUCTION

Vocabulary mastery remains a central concern in English as a Foreign Language (EFL) instruction because vocabulary provides the lexical foundation for listening, speaking, reading, and writing. Students who lack sufficient vocabulary often

struggle to understand classroom input, follow reading passages, produce meaningful sentences, and participate confidently in oral interaction. In Indonesian junior high schools, this problem is particularly evident because students are expected to understand English texts and convey simple meanings despite having limited exposure to English outside the classroom. Some research has repeatedly emphasized that vocabulary development requires systematic, attractive, and repeated learning experiences rather than memorization alone (Pauliana et al., 2023; Ramadani et al., 2020). This concern is also reflected in Nappu (2014), which showed that students' English vocabulary improved when instruction shifted from teacher-centered routines to more engaging computer-assisted language learning activities. When vocabulary instruction is dominated by teacher explanation and isolated word lists, students may remember words temporarily but fail to retrieve them when asked to use the words in meaningful tasks. Therefore, vocabulary instruction needs to provide repeated exposure, active recall, and affective support so that students can connect words with meaning, form, and use.

The urgency of this study emerged from specific classroom problems observed before the intervention. Preliminary observation in the eighth-grade classroom showed that many students had difficulty identifying the meanings of basic English words, even when the words appeared in familiar topics such as family, animals, home, and personal description. Students often depended on direct translation from the teacher and were hesitant to answer when asked to recall vocabulary independently. They also showed confusion in distinguishing nouns, verbs, and adjectives. For example, words referring to people, objects, actions, and qualities were frequently treated as the same type of vocabulary, so students could not easily use them in simple descriptive phrases or sentences. This problem affected their ability to understand descriptive texts and to produce simple descriptions because they did not know whether a word functioned as a thing, an action, or a characteristic.

The classroom situation also indicated low participation during vocabulary lessons. When vocabulary was taught through conventional explanation, copying word lists, and memorizing meanings, only a few students responded actively, while others waited for answers from the teacher or their classmates. Some students appeared reluctant to speak because they were afraid of making mistakes in pronunciation, spelling, or meaning. Others became passive after failing to remember previously taught words. This condition suggested that the vocabulary problem was not only cognitive but also affective. Students needed a learning activity that could reduce fear, encourage participation, and make vocabulary practice feel less like individual testing. Without such support, vocabulary learning risked remaining mechanical, repetitive, and disconnected from students' active classroom involvement.

Another problem was the limited opportunity for repeated retrieval. In the observed classroom, students were usually introduced to new words, asked to write them down, and then given exercises. However, they had few opportunities to retrieve the same vocabulary repeatedly through meaningful interaction. As a result,

students could recognize some words immediately after explanation but had difficulty recalling them in later tasks. This showed that students needed a strategy that could help them practice vocabulary several times in an enjoyable and purposeful way. Vocabulary mastery requires not only exposure but also active recall, feedback, and reinforcement. Therefore, a classroom activity that obliges students to recall meanings, classify word classes, and use vocabulary before continuing the task is pedagogically necessary.

Recent studies also show that vocabulary learning improves when students are engaged with interactive learning media and classroom activities. Word-chain activities, alphabet games, crossword-based applications, Scrabble, Jeopardy, Quizizz, and other game-like strategies have been reported to increase students' participation, motivation, and vocabulary achievement in EFL classrooms (Asmawati, 2022; Emelia et al., 2024; Katemba, 2023; Sabila & Niswa, 2023). The pedagogical value of structured peer interaction is also supported by Rospinah et al. (2021), who found that group work activities involving discussion and cooperative tasks improved learners' English performance. These studies indicate that games are not merely entertainment; when designed around instructional objectives, they can function as structured learning tasks. Games invite students to retrieve vocabulary, negotiate answers with peers, pay attention to feedback, and repeat the same language forms in a less threatening atmosphere. Such features are important for junior high school learners because adolescents often hesitate to speak in English for fear of making mistakes. Game-based learning can reduce this anxiety by shifting the classroom atmosphere from individual testing to collaborative challenge.

The growth of digital and gamified learning platforms has expanded possibilities for vocabulary instruction. Studies on TikTok, Quizizz, gamified flipped classrooms, and massively multiplayer online role-playing games show that students can acquire vocabulary more positively when the learning environment is interactive, multimodal, and connected to learners' interests (Efendi et al., 2025; Putri et al., 2024; Rita & Subekti, 2023; Salsabil et al., 2023; Sujarwati et al., 2025). In the broader area of English language teaching, Nappu et al. (2022) found that Google Meet-based online learning positively affected students' academic writing performance, while Kibar et al. (2023) highlighted the importance of teachers' strategies in utilizing ICT for EFL instruction in Indonesian schools. These studies show that digital tools can support language learning when infrastructure, teacher readiness, and student access are available.

However, the expansion of digital learning does not eliminate the relevance of low-technology vocabulary games in Indonesian EFL classrooms. In many school contexts, especially outside large urban centers, teachers still face practical limitations such as unstable internet access, limited projectors, insufficient student devices, electricity interruptions, and unequal digital literacy among students. Even when digital platforms are available, classroom time may be reduced by technical preparation, login problems, application errors, or students' unfamiliarity with the

tools. These conditions can make highly digital activities difficult to apply consistently, particularly in ordinary classrooms where teachers need strategies that are quick, affordable, and adaptable. Low-technology games remain relevant because they allow teachers to maintain interaction, competition, repetition, and feedback without depending on internet connection or digital devices.

Low-technology vocabulary games also have pedagogical advantages that are not merely practical. They can create direct face-to-face interaction, encourage peer discussion, and allow teachers to observe students' thinking processes more closely. When students answer orally, negotiate with teammates, or justify why a word is a noun, verb, or adjective, the teacher can immediately identify misconceptions and provide correction. This kind of real-time classroom interaction is sometimes less visible in individual digital quizzes, where students may focus mainly on speed or scores. Low-tech games also help reduce distraction because students' attention is directed to the vocabulary task, the teacher's prompts, and their peers' responses rather than to unrelated features of a digital device. Therefore, simple classroom games can complement, rather than compete with, digital platforms.

In resource-limited EFL settings, low-technology games are particularly valuable because they support inclusive participation. Students who do not have smartphones, internet data, or confidence in using digital applications can still participate equally. Teachers can modify the game using a whiteboard, paper cards, vocabulary lists, pictures, or classroom objects. The activity can be repeated across different topics without additional cost, and the level of difficulty can be adjusted immediately based on students' responses. For vocabulary learning, this flexibility is important because students often need repeated practice with the same word categories before they can use them accurately. Thus, low-tech vocabulary games remain relevant because they provide a feasible bridge between the principles of game-based learning and the realities of Indonesian classroom conditions.

Tic-Tac-Toe is one such strategy. It is a familiar, low-cost, and easy-to-organize game that can be adapted for vocabulary learning. In a language classroom, the ordinary three-by-three grid can be transformed into a vocabulary task: students or groups may place a mark only after they correctly identify a word's meaning, classify a word as a noun, verb, or adjective, pronounce a word, complete a sentence, or match a word with a picture or definition. The competitive structure encourages quick retrieval, while the team format encourages peer discussion and correction. This game is particularly relevant to the classroom problems identified before the intervention because it directly addresses students' difficulty in recalling vocabulary, distinguishing word classes, and participating actively. Instead of asking students to memorize lists individually, Tic-Tac-Toe requires them to retrieve vocabulary repeatedly, discuss answers with peers, and receive immediate confirmation from the teacher before continuing the game. A study on Tic-Tac-Toe in vocabulary teaching found that students' mean score improved after exposure to the game and that the strategy had a strong effect on vocabulary mastery (Loviyani et al., 2022). This result is consistent with Nappu et al. (2025), who reported that

the I Spy game significantly improved seventh-grade students' vocabulary mastery through clue-based, interactive, and playful learning activities. Compared with many digital games, Tic-Tac-Toe has the additional advantage of being flexible and inclusive. Teachers can adjust the difficulty of the prompts, use topics from the syllabus, and repeat the activity across meetings without having to prepare complex media.

Despite the increasing number of studies on vocabulary games, more classroom-based evidence is needed on how simple non-digital games can support Indonesian junior high school students' mastery of basic word classes. Previous studies have explored digital platforms and board-game media in vocabulary and speaking instruction, but the use of Tic-Tac-Toe for distinguishing nouns, verbs, and adjectives in descriptive text topics has received less attention in local EFL classroom research (Nuraini & Mubarok, 2025; Setiawan & Hakim, 2023). The study also has relevant work with technology-supported learning, vocabulary instruction, collaborative learning, and cognitively engaging EFL pedagogy by focusing on a low-tech classroom game that is feasible for ordinary junior high school contexts (Kibar et al., 2023; Nappu, 2014; Nappu et al., 2025; Nurmaharaeni et al., 2022; Rospinah et al., 2021). The present study was conducted at a junior high school in Gowa Regency, where preliminary observation showed that students had difficulty recognizing word meanings, recalling vocabulary after explanation, distinguishing nouns, verbs, and adjectives, and participating actively in vocabulary practice. These classroom problems strengthened the need for an instructional strategy that could provide repeated retrieval, peer support, immediate feedback, and a more enjoyable learning atmosphere.

Based on this background, the study addressed the following research question: Is game-based learning using the Tic-Tac-Toe game effective in improving the vocabulary mastery of eighth-grade students? The objective of the study was to examine improvements in students' vocabulary mastery after the implementation of the Tic-Tac-Toe game-based learning approach. The study contributes to classroom practice by offering a practical vocabulary strategy that is easy to implement in resource-limited EFL settings. It also contributes to the discussion of game-based learning by showing that low-tech, teacher-adapted games can still provide meaningful opportunities for retrieval practice, collaboration, vocabulary reinforcement, and equal classroom participation despite the increasing popularity of digital learning platforms.

LITERATURE REVIEW

Vocabulary Mastery in Indonesian EFL Classrooms

Vocabulary mastery refers to learners' ability to recognize, understand, recall, and use words appropriately in context. For junior high school students, vocabulary mastery does not only involve knowing Indonesian equivalents of English words. It also includes understanding spelling, pronunciation, word meaning, and

grammatical function. The distinction between nouns, verbs, and adjectives is especially important because these word classes appear frequently in descriptive texts and simple oral descriptions. When students cannot distinguish word classes, they may understand isolated meanings but still fail to construct meaningful phrases or sentences. This is why vocabulary learning should combine meaning-focused instruction with repeated opportunities to use and classify words.

In Indonesian EFL classrooms, students' vocabulary problems are often connected to limited exposure, low motivation, and teaching routines that depend heavily on memorization. Nappu (2014) showed that computer-assisted language learning helped improve junior high school students' English vocabulary and made the learning process more effective, efficient, and attractive. More recently, Nappu et al. (2025) found that the I Spy game increased seventh-grade students' vocabulary scores from the poor to the good category after six implementation sessions. Pauliana et al. (2023) reported that vocabulary learning improved when alphabet-game activities were used to create a more active learning process. Similarly, Ramadani et al. (2020) showed that word-chain games could improve eighth-grade students' vocabulary achievement by giving learners repeated chances to recall words under an interactive format. These studies share a common finding: vocabulary learning becomes more effective when students actively retrieve words rather than only receive teacher explanation. However, they differ in the learning mechanism used. Computer-assisted learning emphasizes digital support, I Spy emphasizes clue-based observation, alphabet games emphasize letter-based word generation, and word-chain games emphasize sequential recall. The present study builds on these findings by using Tic-Tac-Toe as a simple grid-based game that combines retrieval, classification, competition, and peer discussion.

Game-Based Learning and Vocabulary Instruction

Game-based learning refers to the purposeful use of game structures to achieve learning objectives. In EFL vocabulary teaching, games may include rules, points, turns, competition, collaboration, problem solving, and immediate feedback. The pedagogical value of games lies in the way they transform repetition into meaningful challenge. Vocabulary learning requires repeated exposure, but repetition can become monotonous if students simply copy, translate, or memorize words. Games can make repetition more acceptable because students repeat vocabulary while trying to win, defend group answers, or complete a task.

Previous vocabulary game studies show several common patterns. First, most studies report improvement in students' vocabulary achievement after game-based instruction. Sabila and Niswa (2023) found that Scrabble improved students' vocabulary mastery because learners had to form words from available letters. Katemba (2023) reported that crossword-puzzle-based vocabulary learning supported vocabulary development through an enjoyable word activity. Pauliana et al. (2023) showed that alphabet games encouraged students to recall words more actively, while Ramadani et al. (2020) found that word-chain games improved

students' vocabulary achievement through repeated word production. Although these studies used different game formats, they converge on the idea that games are useful because they require learners to retrieve, recognize, and manipulate vocabulary repeatedly.

Second, the studies differ in the kind of vocabulary processing they emphasize. Scrabble focuses strongly on spelling and word formation because students must arrange letters correctly. Crossword puzzles emphasize meaning recognition and clue interpretation. Alphabet games require learners to generate words based on initial letters, while word-chain games require quick recall and continuation from previous answers. Jeopardy, as reported by Asmawati (2022), emphasizes question-based vocabulary recall in a competitive classroom format. Tic-Tac-Toe differs from these games because it can be adapted to multiple vocabulary tasks within one simple structure. Each grid square can require students to identify meaning, classify a word as a noun, verb, or adjective, complete a sentence, pronounce a word, or match a word with a picture. Therefore, Tic-Tac-Toe is flexible for teaching both vocabulary meaning and word-class awareness.

Third, many vocabulary game studies highlight affective benefits, especially increased interest, motivation, and participation. Asmawati (2022) found that students perceived Jeopardy as an interesting strategy for vocabulary learning. Sabila and Niswa (2023) also reported that Scrabble supported students' interest in vocabulary learning, while Rospinah et al. (2021) demonstrated that group work activities improved English performance by encouraging students to think, discuss, and respond together. These findings suggest that games support vocabulary learning not only cognitively but also socially and emotionally. Students who are afraid of making mistakes may participate more willingly when responsibility is shared with teammates. In this respect, Tic-Tac-Toe is relevant because the team-based format allows students to discuss answers before responding, reducing individual pressure while maintaining active involvement.

However, the literature also shows that games need clear instructional control. Asmawati (2022) warned that teachers should ensure students focus on vocabulary meaning rather than only scores or winning. This issue is important because game-based learning can lose its educational value if competition becomes more dominant than language practice. In vocabulary instruction, a game becomes pedagogical only when its rules require students to process vocabulary accurately. Therefore, in Tic-Tac-Toe vocabulary learning, students should be allowed to place a mark on the grid only after giving a correct vocabulary response. This rule connects the game goal with the language goal and prevents the activity from becoming mere entertainment.

Tic-Tac-Toe As a Low-Tech Vocabulary Game

Tic-Tac-Toe is useful for classroom vocabulary instruction because it is simple, familiar, and flexible. The game normally requires players to place marks in a three-

by-three grid and form a horizontal, vertical, or diagonal line. In vocabulary instruction, this grid can be adapted into a sequence of language prompts. For example, each square may contain a vocabulary item, a picture, a definition, an incomplete sentence, or a word-class question. Students must answer correctly before they can claim the square. Through this procedure, the game trains students' quick retrieval and strengthens their ability to recognize vocabulary categories.

The usefulness of Tic-Tac-Toe has been supported by Loviyani et al. (2022), who found that the game significantly improved elementary students' English vocabulary mastery after six implementation sessions. This study shares similarities with other vocabulary game studies because it uses repeated exposure, competition, and feedback as the main learning mechanisms. However, Tic-Tac-Toe also differs from games such as Scrabble, crossword puzzles, and digital quizzes. Unlike Scrabble, it does not require complex letter arrangement. Unlike crossword puzzles, it does not depend entirely on written clues. Unlike Quizizz, it does not require digital devices or internet access. Its strength lies in its adaptability: the teacher can decide what type of vocabulary task appears in each grid square and can adjust the difficulty based on students' ability.

This adaptability makes Tic-Tac-Toe particularly relevant for the present study. The students' classroom problem was not only limited vocabulary knowledge but also difficulty distinguishing nouns, verbs, and adjectives. Tic-Tac-Toe can directly address this problem because the grid can be designed to include word-class identification tasks. For example, one square may ask students to identify whether "beautiful" is an adjective, another square may ask them to use "run" as a verb, and another may ask them to match "rabbit" with a noun category. In this way, the game supports both vocabulary recall and grammatical awareness. This feature distinguishes the present study from studies that focus mainly on vocabulary meaning or spelling.

Analytical Comparison of Digital and Non-Digital Vocabulary Games and the Research Gap

Recent Indonesian studies show a broad movement toward interactive vocabulary learning, especially through digital and gamified platforms. Digital applications such as Quizizz have been found to improve vocabulary mastery and classroom enthusiasm (Efendi et al., 2025; Emelia et al., 2024). Gamified flipped instruction has also been reported to increase engagement and vocabulary development, particularly when students interact with vocabulary before and during classroom tasks (Putri et al., 2024; Sujarwati et al., 2025). Informal digital games have also been associated with learners' vocabulary knowledge, self-confidence, and willingness to communicate (Salsabil et al., 2023). These studies commonly show that digital games can provide instant feedback, attractive interfaces, scoring systems, and multimodal input.

Despite these advantages, digital vocabulary games differ from low-tech games in their classroom requirements. Quizizz, TikTok, gamified flipped classrooms, and online role-playing games require devices, internet access, digital literacy, or teacher preparation with technology. These requirements may not always be available in Indonesian junior high schools. Kibar et al. (2023) emphasized that ICT integration depends on teacher strategy and readiness, while Nappu et al. (2022) showed that technology-supported learning is beneficial when it is pedagogically organized. Therefore, digital tools are useful but not always equally feasible.

Non-digital games such as Tic-Tac-Toe, Scrabble, alphabet games, word-chain games, and board games remain important because they are easier to implement in resource-limited classrooms. They can be conducted using a whiteboard, paper, cards, or oral prompts. They also allow direct teacher monitoring and face-to-face peer discussion. Nuraini and Mubarok (2025), for instance, highlighted the value of board games in improving students' speaking skills, showing that non-digital games can create communicative practice through social interaction. Compared with digital games, low-tech games may offer fewer multimedia features, but they provide stronger classroom immediacy: the teacher can instantly modify prompts, clarify wrong answers, and observe which students need support. Thus, the difference between digital and non-digital games should not be viewed as a contrast between modern and outdated methods. Instead, both types can support vocabulary learning when they are aligned with classroom needs and instructional goals.

The reviewed studies show that vocabulary games generally improve students' vocabulary mastery, motivation, and classroom participation. They also show that different games support different aspects of vocabulary learning. Scrabble emphasizes spelling and word construction, crossword puzzles emphasize clue-based meaning recognition, alphabet and word-chain games emphasize rapid recall, Jeopardy emphasizes competitive question-answer practice, and digital platforms emphasize engagement through technology-supported feedback and scoring. However, fewer classroom-based studies have examined how Tic-Tac-Toe can be used specifically to improve junior high school students' mastery of basic word classes, especially nouns, verbs, and adjectives in descriptive topics.

This gap is important because word-class awareness is necessary for students to move beyond memorizing isolated words. Students need to know not only what a word means but also how it functions in a sentence. The present study addresses this gap by examining the use of Tic-Tac-Toe as a low-tech, adaptable vocabulary game that requires students to recall meanings, classify word classes, discuss answers with peers, and receive immediate teacher feedback. In this way, the study contributes to practical EFL pedagogy by showing how a simple classroom game can support vocabulary mastery in a resource-limited Indonesian junior high school context.

METHOD

Design and Sample

This study used a pre-experimental one-group pre-test–post-test design. The design was selected because the study aimed to examine students' vocabulary mastery before and after the implementation of Tic-Tac-Toe game-based learning in one intact classroom. The design can be represented as T1–X–T2, where T1 refers to the pre-test, X refers to the treatment using Tic-Tac-Toe game-based learning, and T2 refers to the post-test. This design is commonly used in classroom-based EFL studies when the researcher seeks to obtain initial evidence of instructional effectiveness in a natural class setting before conducting a larger controlled study. Similar pre-test–post-test logic has been used in Indonesian vocabulary research on word-chain games, crossword-based vocabulary learning, Tic-Tac-Toe, and other interactive learning media (Katemba, 2023; Loviyani et al., 2022; Ramadani et al., 2020). However, because the design did not include a control group, the findings should be interpreted as evidence of classroom-level improvement rather than definitive causal generalization.

The participants were 30 students of class VIII.4 at a junior high school in Gowa Regency, Indonesia. The class was purposively selected because preliminary classroom observations and teacher considerations indicated that the students still needed support with vocabulary mastery, especially in recognizing nouns, verbs, and adjectives in simple descriptive topics. Purposive selection was appropriate for this classroom-based study because the treatment was designed to address a practical learning problem identified in a specific class. The study focused on one intact class to maintain the natural classroom setting and to avoid disrupting the existing school schedule. The participants had learned basic English vocabulary at previous grade levels, but their classroom performance suggested that they still had difficulty accurately recalling and classifying vocabulary items.

Instruments and Procedures

The instrument was a teacher-made vocabulary test administered as both the pre-test and the post-test. The test consisted of multiple-choice and fill-in-the-blank items focusing on three vocabulary categories: nouns, verbs, and adjectives. These categories were selected because they were relevant to the descriptive topics used during the treatment and because students' preliminary performance showed difficulty in distinguishing these word classes. The test items were aligned with the vocabulary taught in the treatment sessions, so the assessment measured the intervention's vocabulary focus. Student scores were classified into five achievement categories: very good (91–100), good (76–90), fairly good (61–75), poor (51–60), and very poor (0–50). The use of vocabulary tests before and after intervention is consistent with classroom action and experimental studies on vocabulary games and interactive vocabulary media (Emelia et al., 2024; Pauliana et al., 2023; Sabila & Niswa, 2023).

The study was conducted in eight meetings consisting of one pre-test session, six treatment sessions, and one post-test session. During the pre-test, students completed the vocabulary test individually to identify their initial mastery of nouns, verbs, and adjectives. The six treatment sessions then implemented Tic-Tac-Toe game-based learning using vocabulary from familiar descriptive topics such as friend, father, house, cat, and rabbit. These topics were chosen because they were close to students' daily experiences and allowed the teacher to introduce concrete nouns, common verbs, and descriptive adjectives.

Each treatment meeting followed a structured sequence. First, the teacher introduced the target vocabulary and modeled its pronunciation, meaning, and word class. Second, students were divided into small groups or competing teams. Third, the teacher drew a three-by-three Tic-Tac-Toe grid on the board or prepared a grid on paper. Each square was connected to a vocabulary prompt, such as identifying a word's meaning, classifying it as a noun, verb, or adjective, completing a sentence, or matching a word to a description. Fourth, a team was allowed to place its mark on the grid only after giving a correct answer. When the answer was incorrect, the teacher provided feedback, and the other team had the opportunity to respond. Fifth, after each round, the teacher reviewed the vocabulary items that caused difficulty and asked students to repeat or use them in simple phrases. This procedure was intended to combine retrieval practice, competition, peer collaboration, and immediate feedback.

Feedback and correction were given throughout the game sessions to ensure that the activity supported vocabulary understanding rather than only competition. When a team gave a correct answer, the teacher confirmed the answer immediately, repeated the word clearly, and asked students to notice its meaning and word class. For example, when students correctly identified *rabbit* as a noun, the teacher reinforced the answer by saying that it referred to an animal or thing and then asked students to produce another noun from the topic. This confirmation helped students connect the correct response with the vocabulary category being practiced.

When a team gave an incorrect or incomplete answer, the teacher did not directly move to the next item. Instead, the teacher used corrective prompts to guide students toward the correct answer. The teacher asked follow-up questions such as "Is this a thing, an action, or a characteristic?", "Can this word describe a person or object?", or "Can we use this word to show an action?" These guiding questions helped students reconsider the meaning and grammatical function of the word. If students still could not answer correctly, the teacher provided a short explanation, gave an example in a simple phrase or sentence, and invited the group to repeat the correct form. This procedure allowed correction to function as scaffolding rather than punishment.

Peer correction was also encouraged during the game. Before a final answer was accepted, students in each team were given time to discuss their response. If one

student gave an incorrect answer, teammates were allowed to help revise it. This peer-supported correction was intended to reduce anxiety and encourage students to learn from one another. After the teacher confirmed the correct answer, all students were asked to pay attention to the explanation, not only the team that answered. In this way, feedback became a whole-class learning opportunity.

The teacher also used delayed correction at the end of each round. Vocabulary items that were frequently answered incorrectly were written again on the board and reviewed together. The teacher grouped the words into nouns, verbs, and adjectives, then asked students to explain why each word belonged to a particular category. This review helped students see patterns across vocabulary items and strengthened their word-class awareness. For example, nouns were connected with people, animals, places, or things; verbs were connected with actions; and adjectives were connected with qualities or descriptions. The teacher then asked students to use several words in simple descriptive phrases or sentences to reinforce meaning and use.

The feedback procedure was designed in line with findings from previous game-based vocabulary studies. For example, Scrabble and alphabet games have been shown to support vocabulary learning by fostering active participation and repeated word practice (Pauliana et al., 2023; Sabila & Niswa, 2023). Jeopardy and crossword-based strategies also demonstrate that word games can increase student interest when teachers keep the focus on meaning and vocabulary use (Asmawati, 2022; Katemba, 2023). In addition, Nappu et al. (2025) emphasized that vocabulary games are most effective when they guide students to observe clues, infer meaning, and repeatedly recall words. In the present study, feedback and correction were therefore embedded into the Tic-Tac-Toe procedure so that students could receive immediate confirmation, revise misunderstandings, and strengthen vocabulary understanding during the game.

Data Analysis

The quantitative data were analyzed by comparing students' pre-test and post-test scores. First, the mean score of each vocabulary category was calculated to identify improvement in nouns, verbs, and adjectives. Second, the overall mean scores were compared to determine the total gain after the treatment. Third, hypothesis testing was conducted using the t-statistic reported in the analysis. The null hypothesis (H0) stated that Tic-Tac-Toe game-based learning was not effective in improving students' vocabulary mastery, while the alternative hypothesis (H1) stated that Tic-Tac-Toe game-based learning was effective. The decision was made by comparing the t-test value with the t-table value at the .05 significance level. The reporting of results was strengthened by presenting both descriptive data and hypothesis testing, as recommended by recent vocabulary studies that combine score improvement with statistical evidence (Efendi et al., 2025; Loviyani et al., 2022; Sujarwati et al., 2025).

The study reported students' scores collectively. The teaching activity was conducted as part of classroom vocabulary instruction, and the data were used to describe the class's learning outcome. Methodologically, the study had a limitation because it did not employ a control group. Therefore, improvements on the post-test should be interpreted with caution and should not be generalized to all junior high school students without further research. Future studies should include a comparison group, a larger sample, item validation, and reliability analysis to strengthen the evidence.

RESULTS AND DISCUSSION

The results indicate that students' vocabulary mastery improved after the implementation of the Tic-Tac-Toe game-based learning. Table 1 presents the mean scores of the three vocabulary components and the overall score in the pre-test and post-test.

Table 1. Mean Scores of Students' Vocabulary in the Pre-Test and Post-Test

Component	Pre-test	Post-test	Gain	Interpretation
Noun	38.10	83.75	45.65	Very poor → Good
Verb	26.70	75.71	49.01	Very poor → Fairly good
Adjective	36.10	84.67	48.57	Very poor → Good
Overall	34.50	80.50	46.00	Very poor → Good

Before the treatment, students' mean scores were low across all vocabulary components. The noun mean score was 38.10, the verb mean score was 26.70, and the adjective mean score was 36.10. These results show that students initially had substantial difficulty recognizing and using the target word classes. Among the three components, verbs were the weakest area before the intervention. This suggests that students found action words more difficult to identify and use than nouns and adjectives. The overall pre-test mean score was 34.50, which was categorized as very poor. This finding supports the preliminary classroom observation that students needed additional vocabulary support, especially in recognizing the function of words in simple descriptive contexts.

After six meetings of Tic-Tac-Toe game-based learning, the post-test mean scores increased in all components. The noun score increased from 38.10 to 83.75, the verb score increased from 26.70 to 75.71, and the adjective score increased from 36.10 to 84.67. The overall mean score increased from 34.50 to 80.50. These gains indicate that the treatment was followed by a strong improvement in students' vocabulary mastery across all word classes. The improvement pattern shows that all three categories developed substantially, but the size and final level of development differed across components.

The highest numerical gain appeared in the verb category, which increased by 49.01 points. This shows that verbs developed most significantly in terms of score

improvement from pre-test to post-test. However, because verbs started from the lowest pre-test score, the final post-test score for verbs remained lower than nouns and adjectives. The verb score reached 75.71, which was categorized as fairly good, while nouns and adjectives reached the good category. This means that the Tic-Tac-Toe activity helped students improve verbs considerably, but verbs still remained the most challenging vocabulary category after the treatment.

The adjective category showed the second-highest gain, increasing by 48.57 points from 36.10 to 84.67. This indicates that students became much better at recognizing descriptive words after the intervention. Because the treatment used familiar descriptive topics such as friend, father, house, cat, and rabbit, students had many opportunities to connect adjectives with observable qualities, such as size, color, appearance, and character. As a result, adjectives reached the highest post-test mean score among the three components.

The noun category also showed strong improvement, increasing by 45.65 points from 38.10 to 83.75. Nouns were easier for students to identify because many of them referred to concrete objects, people, animals, or places that could be directly connected with classroom examples and descriptive topics. Although the noun gain was slightly lower than the gains for verbs and adjectives, the final noun score was high and reached the good category. This suggests that Tic-Tac-Toe was effective for reinforcing concrete vocabulary through repeated recognition and classification tasks.

Overall, the pattern of improvement indicates that Tic-Tac-Toe game-based learning supported all vocabulary areas, but it was especially effective in helping students improve from very low initial performance. Verbs showed the largest gain, adjectives achieved the highest final score, and nouns showed stable improvement into the good category. This pattern suggests that the game provided repeated retrieval practice for all word classes, while the nature of each vocabulary category influenced the final achievement level.

Table 2. Result of Hypothesis Testing

N	df	t-test	t-table (.05)	Decision
30	29	5.51	2.045	H0 rejected; H1 accepted

The hypothesis testing result also supports the descriptive improvement. The t-test value was 5.51, while the t-table value at the .05 significance level with 29 degrees of freedom was 2.045. Because the t-test value exceeded the critical t-value, the null hypothesis was rejected, and the alternative hypothesis was accepted. This means that the improvement in students' vocabulary mastery after the treatment was statistically significant. In other words, Tic-Tac-Toe game-based learning was effective in improving the vocabulary mastery of the eighth-grade students in this classroom context.

The findings demonstrate that Tic-Tac-Toe game-based learning supported students' vocabulary mastery by changing vocabulary practice from a passive memorization activity into an interactive classroom task. Instead of only listening to teacher explanations, copying vocabulary lists, or completing individual exercises, students were required to retrieve words, discuss possible answers with teammates, and respond to vocabulary prompts before they could claim a square on the grid. This procedure made vocabulary learning more active because students had to process the meaning and function of each word during the game. The result is consistent with Loviyani et al. (2022), who found that Tic-Tac-Toe improved students' English vocabulary mastery, and with Nappu et al. (2025), who reported that the I Spy game supported vocabulary learning through clue-based and playful interaction.

A more critical interpretation of the findings suggests that the improvement was not caused by the game format alone, but by the interaction of three learning mechanisms: repetition, peer collaboration, and competition. Each mechanism played a different role in supporting vocabulary mastery. Repetition strengthened memory and recall; peer collaboration helped students negotiate meaning and correct misunderstanding; and competition increased attention and urgency. However, these three elements needed to be balanced carefully. If repetition was not meaningful, it could become mechanical. If collaboration was not guided, stronger students could dominate the activity. If competition was too strong, students might focus more on winning than learning. Therefore, the value of Tic-Tac-Toe depended on how the teacher organized these elements around clear vocabulary objectives.

Repetition played the most direct role in improving vocabulary mastery. Vocabulary learning requires repeated exposure and retrieval because students often forget words after a single explanation. In the Tic-Tac-Toe activity, repetition occurred naturally through repeated turns, repeated prompts, and repeated review of difficult items. Students had to recall word meanings, identify word classes, and use vocabulary several times before the game ended. This kind of repetition was more meaningful than ordinary drilling because students repeated vocabulary in order to solve a task and advance their team's position in the game. Similar benefits of repeated vocabulary retrieval have been found in studies on word-chain games, alphabet games, Scrabble, and crossword-based vocabulary learning (Katemba, 2023; Pauliana et al., 2023; Ramadani et al., 2020; Sabila & Niswa, 2023).

However, repetition alone was not sufficient. If students only repeated words without understanding their meaning or grammatical function, the activity would risk becoming another form of memorization. The Tic-Tac-Toe procedure reduced this risk by connecting repetition with decision-making. Students did not simply repeat a word; they had to decide whether it was a noun, verb, or adjective, match it with a meaning, or complete a simple prompt. This explains why the game supported not only recognition of vocabulary but also word-class awareness. Nouns improved because they were concrete and easy to associate with people, animals,

places, or things. Adjectives improved because descriptive topics naturally required students to identify qualities such as size, color, appearance, and character. Verbs also improved substantially, although they remained lower than nouns and adjectives because action words usually require more contextual understanding and sentence-level use.

Peer collaboration played a different role. While repetition helped students remember vocabulary, collaboration helped them clarify and negotiate meaning. During the game, students were not immediately required to answer individually. They could consult teammates before giving a final response. This process allowed students to compare knowledge, ask for confirmation, and revise uncertain answers. For students with low vocabulary confidence, this peer-supported format reduced the fear of making mistakes. It also allowed stronger students to support weaker students by explaining meanings or reminding them of word categories. This finding is consistent with Rospinah et al. (2021), who showed that group work activities can improve English learning by encouraging students to think, discuss, and respond together.

Nevertheless, peer collaboration also required teacher control. Collaboration can become ineffective if only one or two students dominate the discussion while others remain passive. In the Tic-Tac-Toe sessions, collaboration was most useful when all group members were encouraged to contribute before the team gave an answer. The teacher's role was therefore important in distributing participation, asking follow-up questions, and ensuring that students understood the answer rather than merely accepting the response from the strongest student. This point shows that collaboration in game-based learning should not be assumed to be automatically beneficial. It becomes pedagogically meaningful only when students are required to share reasoning, listen to peers, and participate in the correction process.

Competition contributed mainly to attention, motivation, and classroom energy. The desire to place a mark on the grid and block the opposing team encouraged students to focus on the task and respond more actively. For students who were previously passive during vocabulary lessons, the competitive structure created a reason to participate. The game changed vocabulary practice from an individual exercise into a shared challenge. This is similar to Asmawati's (2022) finding that Jeopardy can make vocabulary learning more interesting because students respond to questions in a competitive format. In the present study, competition helped sustain students' attention across the lesson because each vocabulary item affected the progress of the game.

At the same time, competition had to be managed carefully. If competition becomes the dominant focus, students may prioritize speed, guessing, or winning rather than understanding vocabulary. For this reason, the teacher connected the competitive goal with vocabulary accuracy. A team could not claim a square unless it gave a correct response. When the answer was incorrect, the teacher provided corrective prompts, examples, or peer opportunities before confirming the correct answer.

This rule ensured that competition supported learning rather than distracting from it. In this sense, competition functioned as a motivational frame, while vocabulary retrieval and correction remained the core learning process.

The interaction among repetition, collaboration, and competition explains why Tic-Tac-Toe was effective as a classroom strategy. Repetition gave students multiple encounters with the vocabulary. Collaboration allowed them to process the vocabulary socially and reduce anxiety. Competition made the activity lively and encouraged students to pay attention. These mechanisms worked together: competition encouraged students to participate, collaboration helped them prepare answers, and repetition strengthened memory through repeated turns and review. If one element was missing, the activity might have been less effective. Repetition without competition might have felt monotonous; competition without collaboration might have increased anxiety; and collaboration without repetition might not have provided enough practice for vocabulary retention.

Feedback and correction strengthened these mechanisms further. When students answered correctly, the teacher confirmed the response and reinforced the meaning or word class. When students answered incorrectly, the teacher used guiding questions and examples to direct them toward the correct answer. This immediate correction was important because students could revise their misunderstanding while the vocabulary item was still being discussed. The end-of-round review also helped consolidate difficult words by grouping them again into nouns, verbs, and adjectives. Therefore, Tic-Tac-Toe did not function only as a motivational game; it also created repeated opportunities for diagnosis, correction, and reinforcement.

The findings also show that low-technology games can remain pedagogically valuable in Indonesian EFL classrooms. Digital platforms such as Quizizz and gamified flipped classrooms have been shown to support vocabulary learning and engagement (Efendi et al., 2025; Emelia et al., 2024; Putri et al., 2024; Sujarwati et al., 2025). However, Tic-Tac-Toe offers a practical alternative when schools have limited internet access, devices, or digital infrastructure. The teacher can draw the grid on the board, use vocabulary from the syllabus, and adapt the prompts immediately according to students' responses. This flexibility makes Tic-Tac-Toe useful not only as a learning game but also as a formative assessment tool. Teachers can quickly see which words students understand, which word classes remain confusing, and which students need more support.

From a pedagogical perspective, Tic-Tac-Toe is most useful when it is designed around clear vocabulary targets. Teachers can use the grid after introducing new vocabulary, before reading a descriptive text, or at the end of a lesson to review word meanings and word classes. The squares can contain pictures, definitions, Indonesian meanings, sentence gaps, or classification tasks. To strengthen vocabulary use, teachers can also require students to pronounce a word, create a phrase, complete a simple sentence, act out a verb, or explain why a word belongs

to a particular category. These variations can prevent the activity from becoming repetitive and can help students develop deeper vocabulary understanding.

Nevertheless, the study has limitations. It used a one-group pre-test–post-test design without a control group, so the improvement cannot be compared with a class taught through another method. The participants were also limited to one class at a junior high school, and the study focused only on nouns, verbs, and adjectives in descriptive topics. It did not examine long-term retention or students' ability to use the vocabulary in extended speaking or writing tasks. Future studies should use comparison groups, larger samples, delayed post-tests, and additional data such as classroom observation or student interviews to examine how repetition, peer collaboration, and competition individually and collectively influence vocabulary learning over time.

Overall, the discussion suggests that Tic-Tac-Toe supported vocabulary learning because it combined repetition, peer collaboration, competition, feedback, and correction in a simple classroom format. Repetition strengthened recall, collaboration supported meaning negotiation, and competition increased attention and participation. Its value lies not only in improving vocabulary scores but also in making vocabulary practice more active, socially supported, and feasible for resource-limited EFL classrooms.

CONCLUSION

This study concludes that Tic-Tac-Toe game-based learning was effective in improving the vocabulary mastery of the eighth-grade students involved in this classroom-based study. The students' overall vocabulary achievement improved after the implementation of the game, and the results of hypothesis testing indicated that the improvement was statistically significant. The improvement was found across the three vocabulary components examined in this study: nouns, verbs, and adjectives. These findings suggest that Tic-Tac-Toe can support vocabulary learning when it is used as a structured classroom activity that requires students to recall word meanings, identify word classes, discuss answers with peers, and receive immediate feedback from the teacher.

The most important pedagogical value of this study lies in the practicality of low-tech game-based learning for resource-limited schools. In many Indonesian EFL classrooms, teachers may not always have access to stable internet connections, digital devices, projectors, or paid learning applications. Under these conditions, vocabulary instruction still needs to be interactive, motivating, and meaningful. Tic-Tac-Toe offers a feasible alternative because it can be implemented with simple classroom resources such as a whiteboard, markers, paper, vocabulary cards, or teacher-made prompts. The game allows teachers to create active vocabulary practice without depending on digital infrastructure.

Pedagogically, Tic-Tac-Toe is valuable because it combines repetition, peer collaboration, competition, and feedback in one simple activity. Repetition helps students recall and retain vocabulary. Peer collaboration allows students to discuss meanings and correct misunderstandings together. Competition increases attention and participation, while teacher feedback ensures that the activity remains focused on vocabulary understanding rather than merely winning the game. Through this combination, low-tech game-based learning can transform vocabulary lessons from passive memorization into active and socially supported learning.

For classroom practice, English teachers are encouraged to adapt Tic-Tac-Toe to different vocabulary topics and learning objectives. Teachers can place word meanings, pictures, word-class questions, sentence gaps, or short prompts in the grid. Students should be allowed to claim a square only after giving a correct answer, explaining the word's meaning, or identifying whether the word is a noun, verb, or adjective. Teachers should also provide immediate correction and review difficult items after each round so that students can strengthen their vocabulary understanding. For verb learning, teachers may add action-based prompts, sentence completion, or short phrase production because verbs remained more challenging than nouns and adjectives.

Although the findings are promising, this study has several limitations. It used a one-group pre-test–post-test design without a control group, involved only one class, and focused on short-term improvement in nouns, verbs, and adjectives. Future research should involve larger samples, comparison groups, delayed post-tests, and additional data such as classroom observation or student interviews. Further studies may also compare Tic-Tac-Toe with digital games or other low-tech games to examine which strategies are most effective for vocabulary retention, motivation, and classroom participation.

Overall, this study emphasizes that effective vocabulary instruction does not always require advanced technology. In resource-limited EFL classrooms, low-tech games such as Tic-Tac-Toe can provide meaningful, affordable, and engaging opportunities for vocabulary practice. When carefully guided by the teacher, Tic-Tac-Toe can help students learn vocabulary more actively while supporting equal participation in classrooms with limited technological resources.

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