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Tic-Tac-Toe as a Game-Based Approach to Vocabulary Development Among Grade 10 Students

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Abstract

This study investigated the effectiveness of Tic-Tac-Toe as a game-based approach to vocabulary development among Grade 10 students at Labogon National High School, Mandaue City, during the school year 2025–2026. Employing a quantitative one-group pretest–posttest design, the study involved 45 students selected through cluster sampling. Data were collected using a validated vocabulary assessment and an adapted questionnaire measuring motivation and learning engagement, with descriptive statistics and a paired t-test employed for analysis. Findings revealed that students' overall vocabulary mean score increased from 9.76 (frustration level) to 14.21 (independent level), representing a mean gain of 4.45. Improvements were observed in word understanding, word formulation, and correct grammar usage, with statistically significant differences between pretest and posttest performance. Students also demonstrated very high motivation and learning engagement during the intervention. These findings suggest that Tic-Tac-Toe is a promising instructional strategy for strengthening vocabulary competencies and encouraging active classroom participation. The study recommends implementing the proposed Vocabulary Enhancement Activity and strengthening teachers' use of interactive, game-based instructional strategies. However, the single-group design, limited sample, and four-week intervention restrict causal interpretation and generalizability. The findings support Sustainable Development Goal 4 (Quality Education) by promoting engaging and inclusive vocabulary instruction. Its sustainability contribution lies in providing a practical, adaptable classroom strategy that teachers can integrate into continuing vocabulary development activities. Overall, the study contributes classroom-based evidence supporting game-based English instruction and offers a foundation for instructional improvement and future educational research.

Keywords: English Instruction, Game-Based Learning, Grade 10 Students, Learning Engagement, Student Motivation, Tic-Tac-Toe, Vocabulary Development

1. Introduction

Vocabulary knowledge plays a central role in second-language acquisition and English proficiency by supporting comprehension, communication, and academic performance (Ismail et al., 2022). Nevertheless, vocabulary development remains a persistent educational concern, as students continue to experience difficulties in acquiring and applying appropriate vocabulary (Ismail et al., 2022). Limited vocabulary knowledge can hinder students' ability to understand and use English words effectively (Ismail et al., 2022). In the Philippine context Ong et al. (2019) reported vocabulary development difficulties among students in Cagayan de Oro despite the implementation of various instructional activities. Similarly, Bacus (2018) found that 132 Grade 10 students in the Cebu City Division failed to achieve the expected vocabulary knowledge appropriate to their grade level. Together, these findings underscore the need for instructional interventions that develop vocabulary

comprehension, retention, and application. Conventional vocabulary instruction does not always maintain students' interest or provide adequate opportunities to apply newly learned words. Interactive, learner-centered strategies may therefore help address these instructional limitations. Tic-Tac-Toe provides opportunities for students to participate actively in vocabulary-related tasks while developing confidence, collaboration, and engagement.

Game-based instruction incorporates learning objectives into interactive activities that encourage participation, problem-solving, and meaningful practice. Tic-Tac-Toe has been identified as a useful instructional strategy for improving vocabulary knowledge by making language learning more engaging and collaborative. Honarmand et al. (2015) examined the use of Tic-Tac-Toe and flashcards in vocabulary learning, while Vnucko and Klimova (2023) reviewed digital game-based vocabulary learning as a related but distinct instructional context. The effectiveness of game-based learning is associated with active participation, motivation, and knowledge retention. Educational games allow learners to practice vocabulary through challenges, interaction, and decision-making rather than relying exclusively on memorization (Krath et al., 2021). Incorporating Tic-Tac-Toe into vocabulary instruction provides opportunities to use words in meaningful contexts while encouraging strategic thinking and classroom interaction (Froehling, 2022). Challenge and competition can also strengthen learners' intrinsic motivation (Tsng et al., 2021), while experiential practice and peer interaction support vocabulary acquisition (Krath et al., 2021). Successful implementation requires teachers to prepare instructional materials, explain vocabulary tasks, and manage classroom participation. Ülker and Yangın Ekşi (2026) reviewed gamification practices and their instructional implications in English-language teaching, while Alotaibi (2024) discussed the use of accessible classroom materials to facilitate participation. Game-based instruction provides opportunities for students to practice vocabulary through interactive activities that encourage active participation, contextual understanding, and meaningful learning (Krath et al., 2021). Furthermore, Ashurbayeva (2025) emphasized that integrating game elements into language instruction can increase motivation, participation, and vocabulary retention. These studies support the application of Tic-Tac-Toe as an interactive vocabulary-development strategy that combines word practice, collaboration, and motivation within English language instruction.

Vocabulary development remains a concern across international and Philippine educational settings. Previous research has documented students' difficulties in learning English vocabulary, highlighting the need for appropriate instructional strategies (Ismail et al., 2022). These concerns emphasize the importance of instructional approaches that provide meaningful opportunities for vocabulary acquisition and application. Nationally, vocabulary learning difficulties have been documented among Filipino secondary school students. Ong et al. (2019) identified problems with vocabulary retention despite the use of classroom activities, while Bacus (2018) reported insufficient vocabulary knowledge among Grade 10 students in Cebu City. These findings indicate the need for contextually appropriate interventions that promote active learning and strengthen students' vocabulary competencies. The Philippine educational context also recognizes the importance of technology-supported and innovative instructional practices. Republic Act No. 10844 (2016), also known as the Department of Information and Communications Technology Act, recognizes the role of information and communication technologies in national development. Within this educational context, interactive and game-based instructional strategies may provide opportunities to strengthen classroom participation and vocabulary learning. Such approaches can promote active participation and educational development (Bakhromjon, 2021). Within this context, the present study focused on Grade 10 students at Labogon National High School in Mandaue City, Cebu. It investigated Tic-Tac-Toe as a classroom-based vocabulary intervention addressing word understanding, word formulation, correct grammar usage, motivation, and learning engagement.

The study is anchored on Schema Theory, Chomsky's Psycholinguistic Theory, Constructivist Learning Theory, and Game-Based Learning Theory. These perspectives explain how students activate prior knowledge, process language, construct meaning, and develop vocabulary through interactive learning experiences. Schema Theory, associated with Frederick Bartlett, explains how individuals organize and interpret information through existing mental structures. Schemas enable learners to connect new experiences with prior knowledge, facilitating comprehension and retention (Loveless, 2022; Meylani, 2024). Existing knowledge influences how new information is processed and recalled ("Bartlett's Theory," 2022; Meylani, 2024). As these mental structures become more developed, learners can integrate unfamiliar concepts into their existing understanding (Meylani, 2024). In vocabulary instruction, activating prior knowledge helps students interpret unfamiliar words, recognize contextual meanings, and strengthen comprehension (Hendrick, 2024; Meylani, 2024). Chomsky's Psycholinguistic Theory emphasizes the cognitive and linguistic processes involved in language acquisition, comprehension, and production (Yu, 2022). The theory recognizes the role of innate linguistic capacities in acquiring and processing language (Pankaew, 2024; Yu, 2022). Language development involves cognitive mechanisms that support the recognition, organization, and application of linguistic patterns (Yu, 2022). In vocabulary learning, meaningful language exposure supports students' ability to recognize words, interpret meanings, and develop communication skills (Yu, 2022). These principles support instructional activities that encourage contextual vocabulary use and repeated language practice. Constructivist Learning Theory, associated with Jean Piaget, emphasizes that learners actively construct knowledge through experience, interaction, and reflection rather than passively receiving information (Easterling, 2021; Tsng et al., 2021). Game-based instruction supports this perspective by allowing students to connect new vocabulary with existing knowledge through meaningful tasks (McLeod, 2025). Active participation encourages students to formulate, define, and

apply words while developing deeper understanding (Balakrishna, 2023; Chan & Lo, 2024). Constructivist learning also emphasizes collaboration and guided participation. Interaction with teachers and peers provides opportunities for learners to construct knowledge through shared experiences, collaborative activities, and instructional support (Adipat et al., 2021; Chand, 2023; Hu, 2024). Repeated vocabulary practice and collaborative activities can reinforce learning and engagement (Stupiansky, 2022; Shen et al., 2024). Appropriate instructional assistance further enables learners to accomplish tasks beyond their independent capabilities (Chand, 2023). Vocabulary learning within constructivist instruction involves integrating unfamiliar words into existing knowledge structures (Chan & Lo, 2024; Sasan, 2023). Collaborative discussions and contextual learning activities enable students to exchange ideas, construct meaning, and participate actively in the learning process (Adipat et al., 2021; Villanueva & Ventura, 2022). Game-Based Learning Theory provides an additional foundation for integrating structured games into vocabulary instruction. Game-based activities can provide opportunities for participation and experiential learning. Game elements such as challenges, rewards, and competition can promote motivation and cognitive engagement (Krath et al., 2021). In Tic-Tac-Toe vocabulary activities, students participate in word-related tasks while applying strategies and interacting with classmates (Froehling, 2022). Such activities provide opportunities for repeated vocabulary practice, active participation, and knowledge retention (Krath et al., 2021; Tsng et al., 2021). Collectively, the four theoretical perspectives support the use of Tic-Tac-Toe as an instructional approach that integrates cognitive processing, knowledge construction, collaboration, and motivation to strengthen vocabulary development among Grade 10 students.

Despite the recognized importance of vocabulary knowledge, students continue to experience difficulties understanding, retaining, and applying English words. Previous studies have documented vocabulary deficiencies among learners, including insufficient vocabulary retention despite classroom activities (Ong et al., 2019) and failure to attain expected vocabulary proficiency at the secondary school level (Bacus, 2018). This evidence points to a continuing need for instructional approaches responsive to students' vocabulary difficulties. Existing literature supports game-based learning as a strategy for promoting active participation, motivation, and vocabulary acquisition. Honarmand et al. (2015) examined Tic-Tac-Toe as an approach to vocabulary learning, while Froehling (2022) discussed the theoretical foundations and educational applications of game-based learning. Nevertheless, the effectiveness of this approach in addressing the specific vocabulary competencies of Grade 10 students at Labogon National High School required investigation. The present study addressed this contextual research gap by examining vocabulary development before and after the implementation of Tic-Tac-Toe. Specifically, it assessed students' performance in understanding words, word formulation, and correct grammar usage, determined the significance of the mean gains, and examined their experiences regarding motivation and learning engagement. The study also sought to provide an empirical basis for developing a Vocabulary Enhancement Activity in English 10. By examining students' vocabulary performance and learning experiences, the research aimed to identify an instructional approach that could support vocabulary acquisition and improve classroom participation.

The study primarily aligns with Sustainable Development Goal 4 (SDG 4): Quality Education, which emphasizes inclusive, equitable, and effective learning opportunities. By investigating Tic-Tac-Toe as a game-based approach to vocabulary development, the research contributes to efforts to improve English language instruction and strengthen essential literacy competencies among Grade 10 students. The intervention promotes active participation, collaborative learning, and meaningful vocabulary practice. Its focus on understanding words, word formulation, and correct grammar usage supports the development of language competencies necessary for academic learning and communication. Moreover, examining students' motivation and learning engagement provides insights into instructional practices that encourage participation and improve learning experiences. The study also has a contextual connection to SDG 9: Industry, Innovation and Infrastructure, particularly its broader emphasis on innovation. This connection is limited to the study's exploration of an innovative instructional strategy rather than technological infrastructure development. The study recognizes instructional innovation through the application of a structured, classroom-based game-based learning approach. However, Tic-Tac-Toe in this investigation is primarily a classroom-based game-based learning approach. Overall, SDG 4 represents the study's principal sustainability alignment, while its relevance to SDG 9 is supplementary and confined to instructional innovation.

The study contributes primarily to educational, institutional, and social sustainability by examining a classroom-based strategy for strengthening English vocabulary development. Its educational sustainability value lies in providing evidence that may help teachers adopt engaging instructional approaches that support vocabulary comprehension, application, and retention. From an educational sustainability perspective, Tic-Tac-Toe provides opportunities for repeated vocabulary practice, meaningful interaction, and active participation. Its application is consistent with instructional principles emphasizing experiential learning, knowledge construction, and student engagement (Chan & Lo, 2024; Krath et al., 2021). By addressing vocabulary learning difficulties, the intervention may support sustained improvement in English language instruction. Regarding institutional sustainability, the findings can guide school administrators and teachers in identifying appropriate vocabulary-development interventions. The proposed Vocabulary Enhancement Activity may serve as an instructional resource for strengthening classroom practices and responding to students' identified learning needs. Teacher preparation, classroom organization, and active participation remain essential considerations in implementing game-based activities (Alotaibi, 2024; Ülker & Yangın Ekşi, 2026). The study also contributes to social sustainability by

recognizing the importance of learner participation, collaboration, and supportive classroom interaction. Game-based learning encourages students to engage with peers, exchange ideas, and participate in shared vocabulary tasks (Hu, 2024; Villanueva & Ventura, 2022). These learning experiences may help establish more participatory classroom environments. Finally, the study supports instructional innovation sustainability through its exploration of a structured game-based approach that can be incorporated into English language teaching. The use of engaging instructional strategies is consistent with literature emphasizing motivation, participation, and meaningful learning experiences (Ashurbayeva, 2025; Bakhromjon, 2021). Collectively, these contributions demonstrate the relevance of Tic-Tac-Toe vocabulary instruction to sustainable educational practices, institutional improvement, collaborative learning, and instructional innovation. The study provides a basis for developing a Vocabulary Enhancement Activity that responds to the vocabulary-development needs of Grade 10 students at Labogon National High School.

2. Material and methods

2.1 Research Design

A quantitative one-group pretest–posttest design was used to examine changes in students' English vocabulary performance following Tic-Tac-Toe instruction. The design involved assessing the same group of respondents before and after the intervention to determine changes in their vocabulary performance. The study focused on three competencies: understanding words, word formulation, and correct grammar usage. Students' motivation and learning engagement were also assessed following the intervention. The research followed the Input–Process–Output (IPO) model. The input consisted of students' pretest and posttest vocabulary scores, significant mean gains, and experiences regarding motivation and learning engagement. The process involved securing approval, validating research instruments, obtaining informed consent, administering assessments, implementing the intervention, collecting data, and applying statistical treatments. The output was a proposed Vocabulary Enhancement Activity designed to strengthen vocabulary development among Grade 10 students.

2.2 Locale of the Study

The research took place at Labogon National High School in Barangay Labogon, Mandaue City, Cebu, Philippines. The school implements the K to 12 curriculum, which includes English language competencies involving word understanding, word formulation, and correct grammar usage. Its regular classroom environment provided an appropriate setting for implementing Tic-Tac-Toe as a vocabulary intervention and assessing students' academic performance, motivation, and learning engagement. The school also offers the Sports Track, distinguishing it from other public secondary schools in Mandaue City.

2.3 Respondents of the Study

The participants were 45 Grade 10 students enrolled at Labogon National High School in school year 2025–2026. Of these, 24 students (53.33%) were female, while 21 students (46.67%) were male. Grade 10 students were selected because their prior exposure to English vocabulary and grammar under the K to 12 curriculum enabled the assessment of their competencies in understanding words, word formulation, and correct grammar usage. Their learning experiences also provided a basis for evaluating motivation and engagement during the Tic-Tac-Toe intervention.

2.4 Sample and Sampling Procedure

Cluster sampling was employed to select one existing Grade 10 section consisting of 45 students. All selected students participated in the one-group pretest–posttest assessment. This sampling procedure enabled the researcher to examine vocabulary development within an existing classroom setting and assess students' experiences during the implementation of Tic-Tac-Toe as a game-based instructional intervention.

2.5 Research Instrument

Data were collected using two research instruments. The first was a 30-item vocabulary assessment derived from validated self-learning modules used by teachers in the Department of Education. It measured students' vocabulary development before and after the intervention in terms of understanding words, word formulation, and correct grammar usage. The instrument was validated by three English master teachers. Students' performance was interpreted using the Philippine Informal Reading Inventory (Phil-IRI) assessment rubric. The second instrument was a 20-item questionnaire adapted from the questionnaire utilized by Balaskas et al. (2023). It assessed students' motivation and learning engagement during the implementation of Tic-Tac-Toe. The questionnaire consisted of affirmative statements rated using a four-point Likert scale, ranging from strongly disagree to strongly agree. Vocabulary performance was classified using the Phil-IRI assessment levels. Scores of 14–15, equivalent to 90–100%, indicated the Independent Level; scores of 11–13, equivalent to 75–89%, indicated the Instructional Level; and scores of 0–10,

equivalent to 74% and below, indicated the Frustration Level. These classifications were used to interpret students' vocabulary performance before and after the intervention. For motivation and learning engagement, the four-point Likert scale assigned ratings of 4 for strongly agree, 3 for agree, 2 for disagree, and 1 for strongly disagree. Mean scores ranging from 3.26–4.00 were interpreted as very high, 2.26–3.25 as high, 1.76–2.25 as low, and 1.00–1.75 as very low.

2.6 Data Gathering Procedure

The researcher initially secured permission from the Mandaue City Schools Division Superintendent, the school principal, and the English master teachers to conduct the study. The research instruments were validated, and the respondents were oriented regarding the study's objectives, procedures, and expected benefits. Informed consent was obtained to ensure voluntary participation. Before implementing the intervention, a pretest was administered to assess students' initial vocabulary performance in understanding words, word formulation, and correct grammar usage. Tic-Tac-Toe was subsequently implemented as a game-based vocabulary learning activity for four weeks. After the intervention, a posttest was administered to determine changes in students' vocabulary performance. A separate questionnaire was distributed after the intervention to assess students' motivation and learning engagement while participating in Tic-Tac-Toe activities. The completed instruments were collected, organized, and tabulated for statistical analysis. The results were interpreted to determine vocabulary development, identify significant mean gains, and assess students' learning experiences. Based on the findings, a Vocabulary Enhancement Activity was proposed to support English 10 instruction.

2.7 Data Analysis Techniques

Descriptive and inferential statistical procedures were used to analyze the collected data. Frequency and percentage were employed to describe the respondents' distribution, while mean scores and standard deviations were computed to determine students' vocabulary performance before and after the Tic-Tac-Toe intervention. These measures were applied to the competencies of understanding words, word formulation, and correct grammar usage. The mean gain was determined by comparing pretest and posttest scores to identify changes in vocabulary performance. A paired-samples t-test was used to determine whether the differences between pretest and posttest mean scores were statistically significant at the 0.05 level of significance. The null hypotheses stated that no significant differences existed in students' vocabulary performance before and after the intervention across the three competencies. Descriptive statistics were also used to analyze students' motivation and learning engagement based on their responses to the four-point Likert-scale questionnaire. The computed mean scores were interpreted using the established verbal descriptions of very high, high, low, and very low. The statistical findings served as the basis for evaluating the intervention and formulating the proposed Vocabulary Enhancement Activity in English 10.

2.8 Ethical Considerations

The researcher obtained permission from the appropriate educational authorities before conducting the study. Approval was sought from the Mandaue City Schools Division Superintendent, the school principal, and the English master teachers. The respondents were informed about the study's purpose, procedures, and expected benefits, and informed consent was obtained to support voluntary participation. These procedures were followed during the collection of pretest, posttest, and questionnaire responses.

3. Results and Discussion

3.1 Vocabulary Development Before and After the Intervention

3.1.1 Vocabulary Development Before Using Tic-Tac-Toe

Prior to the intervention, students' scores fell within the Frustration level for all three vocabulary competencies. Understanding the word obtained a mean score of 9.73 (SD = 1.94), word formulation recorded 9.58 (SD = 1.95), and correct grammar usage achieved 9.96 (SD = 1.93). The aggregate mean was 9.76 (SD = 1.94), indicating limited vocabulary proficiency. Correct grammar usage obtained the highest mean, while word formulation recorded the lowest, although all competencies remained within the Frustration level. These findings indicate that students required additional instructional support in understanding, constructing, and correctly using English vocabulary. Their limited proficiency suggests difficulties in comprehending word meanings and applying vocabulary appropriately. According to Kansızoglu and Bekiroglu (2025), vocabulary development is essential to academic success and supports cognitive skills such as critical thinking and reasoning. The findings also align with Ong et al. (2019), who identified difficulties in vocabulary development and retention despite differentiated classroom activities. Similarly, Bacus (2018) reported that students failed to achieve the vocabulary knowledge expected at their grade level. These findings emphasize the need for targeted interventions to strengthen students' vocabulary competencies.

3.1.2 Vocabulary Development After Using Tic-Tac-Toe

Following the Tic-Tac-Toe intervention, students reached the Independent level in all three competencies. Understanding the word recorded a mean score of 14.16 (SD = 1.61), word formulation obtained 14.20 (SD = 1.62), and correct grammar usage achieved 14.27 (SD = 1.36). The overall mean increased to 14.21 (SD = 1.53), indicating improved vocabulary proficiency. Correct grammar usage remained the highest-performing competency, while all assessed areas demonstrated substantial improvement compared with the pretest results. The improvement from Frustration to Independent level suggests that Tic-Tac-Toe supported students in understanding word meanings, formulating words accurately, and applying appropriate grammatical structures. The findings are consistent with Hendrick (2024), who emphasized activating students' background knowledge to strengthen vocabulary development. According to Yu (2022), exposure to unfamiliar words encourages learners to process linguistic patterns, sounds, and meanings, supporting vocabulary acquisition and comprehension. Similarly, Sasan (2023) emphasized that contextual and collaborative learning experiences promote meaning construction and language mastery. These findings support the instructional value of interactive vocabulary activities in English 10.

3.2 Mean Gain in Vocabulary Development

3.2.1 Mean Gain Across Vocabulary Competencies

Comparing the pretest and posttest scores showed gains in each vocabulary competency. Understanding the word increased from 9.73 to 14.16, producing a mean gain of 4.43 points. Word formulation increased from 9.58 to 14.20, yielding the highest mean gain of 4.62 points. Correct grammar usage improved from 9.96 to 14.27, with a mean gain of 4.31 points. The aggregate mean increased from 9.76 to 14.21, resulting in an overall gain of 4.45 points. All competencies shifted from Frustration to Independent level following the intervention. These improvements suggest that Tic-Tac-Toe provided opportunities for students to strengthen vocabulary comprehension, word construction, and grammatical application through repeated practice and active participation. The highest gain in word formulation indicates notable progress in students' ability to construct and use words. The findings are consistent with the Psycholinguistic Theory discussed by Yu (2022), which emphasizes language processing and vocabulary development through meaningful linguistic experiences. Meaningful vocabulary practice may reinforce language processing and word use. The results suggest that structured game-based activities can reinforce vocabulary knowledge through active language use.

3.2.2 Significant Mean Gain Before and After the Intervention

The statistical comparison showed an increase in the overall mean score from 9.76 in the pretest to 14.21 in the posttest among the 45 respondents, representing a mean gain of 4.45 points. The reported standard deviations for the pretest and posttest were 1.35 and 0.78, respectively. The manuscript interpreted the difference as significant and reported rejection of the null hypothesis, indicating a significant improvement in vocabulary development following the Tic-Tac-Toe intervention. The reported significant mean gain suggests that Tic-Tac-Toe was associated with improved vocabulary performance. Its interactive activities provided opportunities for repeated exposure to word meanings, contextual application, and collaborative learning. The findings suggest that structured and interactive vocabulary activities can support students' engagement and provide opportunities for meaningful language practice. Furthermore, Al Fath (2021) highlighted the role of Tic-Tac-Toe in supporting learning and increasing students' motivation during classroom discussions. The findings support the use of Tic-Tac-Toe as a supplementary strategy for vocabulary instruction.

3.3 Students' Experiences in Vocabulary Development Using Tic-Tac-Toe

3.3.1 Students' Motivation

Students reported a very high level of motivation during the implementation of Tic-Tac-Toe, with an overall mean of 3.40 (SD = 0.65). The highest-rated indicator was feeling comfortable participating in classroom discussions (M = 3.64, SD = 0.57). Students also strongly agreed that the intervention was helpful in classroom discussions (M = 3.62, SD = 0.61), encouraged group participation (M = 3.62, SD = 0.49), motivated them to learn more (M = 3.60, SD = 0.50), and promoted collaboration with classmates (M = 3.60, SD = 0.50). However, students disagreed with preferring to understand task instructions independently without teacher explanations (M = 2.11, SD = 0.80), indicating their continued preference for instructional guidance. These findings suggest that Tic-Tac-Toe encouraged classroom participation, collaboration, and enthusiasm for vocabulary learning while maintaining the importance of teacher support. Jia et al. (2024) examined receptive and productive vocabulary knowledge in digital game-based EFL learning, a related but distinct context. Similarly, Loviyani et al. (2022) emphasized that game-based activities can stimulate students' motivation and vocabulary learning. Tsng et al. (2021) investigated the use of Tic-Tac-Toe in mathematics instruction, providing a related educational context for examining students' experiences with game-based learning. Although students demonstrated strong motivation, their preference for teacher explanations indicates that structured guidance remains necessary during learning activities.

3.3.2 Students' Learning Engagement

Students demonstrated very high learning engagement during the Tic-Tac-Toe intervention, with an overall mean of 3.66 (SD = 0.53). The highest-rated indicator was improvement in the learning process (M = 3.78, SD = 0.42). Students also strongly agreed that the intervention improved their learning results (M = 3.73, SD = 0.45), provided opportunities to demonstrate acquired knowledge (M = 3.73, SD = 0.45), enhanced oral and written expression (M = 3.69, SD = 0.60), and allowed them to work at their own pace (M = 3.69, SD = 0.51). They also reported enjoyment in learning (M = 3.62, SD = 0.58), greater learning autonomy (M = 3.62, SD = 0.65), increased creativity (M = 3.56, SD = 0.59), and more active and experiential learning (M = 3.58, SD = 0.54). These findings indicate that Tic-Tac-Toe supported active participation, learning autonomy, creativity, and meaningful classroom interaction. The high engagement ratings suggest that the intervention created opportunities for students to demonstrate their vocabulary knowledge while participating in enjoyable learning activities. Hendrick's (2024) article emphasized the importance of activating background knowledge to support vocabulary development and learning engagement. Similarly, Körez and Güzeller (2026) reviewed the relationship between game-based English vocabulary learning and learner motivation. These findings highlight the potential of game-based vocabulary activities to promote students' involvement in English language learning.

3.4 Implications for Vocabulary Enhancement Activities

The findings revealed that students' overall vocabulary performance improved from a Frustration level before the intervention (M = 9.76) to an Independent level afterward (M = 14.21), with an aggregate mean gain of 4.45 points. Students also reported very high motivation (M = 3.40) and learning engagement (M = 3.66). These results demonstrate improvements in vocabulary performance alongside positive student experiences during the implementation of Tic-Tac-Toe. However, students' responses also indicated a continued need for teacher guidance when completing learning tasks. The findings provide a basis for developing a Vocabulary Enhancement Activity in English 10 that incorporates Tic-Tac-Toe as a supplementary instructional strategy. The proposed activity may emphasize word understanding, word formulation, correct grammar usage, collaborative participation, and guided vocabulary practice. Similarly, Handikaningtyas et al. (2025) reviewed game-based learning and multimodal media for English vocabulary acquisition, highlighting related approaches that differ from the present non-digital intervention. Likewise, Körez and Güzeller (2026) synthesized research on game-based vocabulary learning and learner motivation. The proposed enhancement activity therefore reflects the study's findings on vocabulary improvement, motivation, and learning engagement.

4. Conclusion & Recommendations

The findings indicated that Tic-Tac-Toe was associated with improved vocabulary performance among 45 Grade 10 students at Labogon National High School during the school year 2025–2026. Before the intervention, students demonstrated a Frustration level in understanding words, word formulation, and correct grammar usage, indicating insufficient vocabulary proficiency. Following the four-week intervention, their performance improved to the Independent level across all three competencies, with a reported significant mean gain between pretest and posttest scores. Students also reported very high levels of motivation and learning engagement, reflecting positive experiences with interactive and collaborative vocabulary activities. These findings suggest that Tic-Tac-Toe is a promising supplementary instructional strategy for strengthening vocabulary knowledge while encouraging active classroom participation. The results provide an empirical basis for the proposed Vocabulary Enhancement Activity in English 10, emphasizing the value of integrating structured game-based activities into vocabulary instruction to address learners' identified needs.

Based on the findings, school administrators are encouraged to support the integration of Tic-Tac-Toe into English 10 vocabulary instruction by providing appropriate instructional resources and professional development opportunities for teachers. English teachers should implement and continuously refine the proposed Vocabulary Enhancement Activity, incorporating structured games that strengthen word understanding, word formulation, and correct grammar usage. Teachers should also provide clear instructions and appropriate guidance during activities while encouraging collaboration, active participation, and independent vocabulary practice. Students are encouraged to participate actively in classroom activities and apply newly acquired vocabulary in meaningful communication. Parents should reinforce vocabulary development by providing encouragement and opportunities for language practice at home. School administrators and teachers should periodically evaluate students' vocabulary performance and learning experiences to determine whether the proposed activities continue to address their instructional needs. Future researchers may examine similar interventions across different schools, grade levels, and learning areas to further assess their applicability and effectiveness.

The study was limited to 45 Grade 10 students from one selected section at Labogon National High School during the school year 2025–2026. Its one-group pretest–posttest design did not include a comparison group, limiting the ability to attribute observed improvements exclusively to Tic-Tac-Toe. The intervention lasted four weeks, and students' motivation and learning engagement were assessed through self-reported questionnaire responses. Consequently, the findings primarily reflect the participants' vocabulary performance and experiences within the

specific research setting. Future studies may include larger samples, comparison groups, additional schools, and longer intervention periods to examine the consistency and sustainability of vocabulary improvements.

5. Compliance with ethical standards

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