



The Effect Of Game-Based Learning Using Tic Tac Toe To Improve Thai Elementary Students' Speaking Skills

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Abstract. This study investigates the effect of game-based learning through Tic Tac Toe on improving the speaking skills of fifth-grade Thai students at Ban Elerd School. A pre-experimental design with a pre-test and post-test was employed, involving 17 participants. The intervention consisted of three sessions using Tic Tac Toe to enhance vocabulary, fluency, and pronunciation. The findings indicate significant improvements in students' speaking abilities, particularly in vocabulary and fluency, with mean scores increasing from 3.12 (pre-test) to 3.86 (post-test). However, pronunciation improvement was not statistically significant, suggesting the need for additional targeted instruction. These results underscore the effectiveness of Tic-Tac-Toe as a game-based learning tool, fostering engagement and reducing anxiety in language learning. This study concludes that game-based learning can effectively support language development in elementary school contexts, particularly in vocabulary acquisition and fluency enhancement.

Keywords :Elementary Students; Game-Based Learning; Speaking Skills; Thai Learners; Tic Tac Toe.

1. INTRODUCTION

Speaking skills play a crucial role in language learning, enabling communication of ideas, opinions, and emotions (Putra, 2017). Learners rely on speaking for direct interaction, such as conversations, questioning, and expressing views during classroom activities like discussions, presentations, and debates. These foster confidence and teacher-student engagement. Beyond the classroom, proficient speaking facilitates social integration, need expression, and relationship building by minimizing misunderstandings. By speaking, teacher and students can interact more while learning the material in the class. This can be done through group discussions, presentations and debates, which students are encouraged to say their thoughts clearly also building their confidence in learning a language.

Young learners' speaking development is transformative, intertwining language acquisition with cognitive and social growth (Pratama & Awaliyah, 2015). Teacher must foster inclusive, interactive environments to boost participation, confidence and motivation. Game-based learning enhances this process; activities like tic tac toe and board games makes speaking engaging, reduce anxiety, expand vocabulary and promote active practice (Ng et al., 2021; O'Neill & Holmes, 2022). Games encourage turn-taking, collaboration and community, aligning with diverse learning styles (Klimova, 2015; Talak-Kiryk, 2010).

Different from Indonesia, young learners in Thailand tend to have a low English language skill, particularly in speaking. Thailand has no colonial relationship with English, it

is showed that English is a foreign language rather than a second language in Thailand for the majority of people (Hayes, 2008). Thai adults rank 101st on the EF English Proficiency Indeks (EF EPI, 2023) with a “very low proficiency” score of 461, suggesting similar challenges for young learners. Factors include low motivation, insufficient practice, limited daily use, and mismatched strategies Kaur et al., (2016) .

Games address these by providing enjoyable, meaningful practice for reinforcement, revision and skill-building (Klimova, 2015). Tic tac toe, for instance, promotes team discussion, reduces speaking fear through peer support, an integrates themed vocabulary for clear articulation and active listening. Its competitive yet low-stress format boosts spontaneity and confidence (Agustia & Amri, 2013). Prior research confirms tic tac toe’s efficacy in improving speaking and vocabulary among junior high students (Agustia & Amri, 2013) .Building on this, the present study examines “The Effect of Game-Based Learning Using Tic Tac Toe on Thai Elementary Students’ Speaking Skills.”

2. LITERATURE REVIEW

Speaking is a productive oral skill essential for verbal communication and interaction, encompassing vocabulary, grammar, pronunciation, and fluency (Bailey, 2005; Qonita & Intan, 2021; Rahmat & Jon, 2023). These core aspects enable learners to engage listeners effectively through activities like imitative, intensive, responsive, interactive, and extensive monologue tasks, while cognitive factors (topic or genre knowledge), affective elements (self-awareness and preferences) and performance conditions (collaboration and time constraints) influence development (Brown & Abeywickrama, 2018; Lestari et al., 2017) . direct strategy training further enhances these skills (Newton & Nation, 2009).

For young learners (ages 3-12), teaching English utilizes early exposure through familiar, motivating tasks like object-related content, accomodating their active, imaginative nature and short attention spans(McKay, 2006; Octaberlina, 2023) . strategies such as listen and repeat, listen and act, question-answer, substitution, spot-the-difference, content-mapping and songs/games build imitation, memorization, vocabulary, accuracy, creativity and enjoyment.

Games integrate seamlessly into this framework as interactive activities promoting thinking, problem-solving, and learning via-rules, competition, relaxation, goals, feedback, conflict and narrative (Deesri, 2002; Prensky, 2001; Talak-Kiryk, 2010) .Diverse genres (action, puzzles and strategy) and types (guessing, matching and multi-player) boost interest, participation, and efficiency without lengthy explanations (Diana, 2010; Kaneko & Kline,

2008; Kostikova, 2017; Liu et al., 2021). Game-based learning applies these mechanics for objective-driven education, featuring engagement, clear narratives, transferable scenarios, interactive freedom, immediate feedback, embedded assessments, adaptive pacing and scalability (Hartt et al., 2020; Poulsen, 2011; Tang et al., 2009).

Tic tac toe exemplifies this approach: a simple two-player 3x3 grid game where player alternate X or O markers to align three horizontally, vertically or diagonally, following rules of marker selection, turns and victory conditions ((Deepa et al., 2020; Sridhar & Shetty, 2021). Adapted for language classes, it requires speaking tasks (e.g., sentences and questions) before marking, creating a low-stakes, competitive environment that reduces anxiety and fosters fluency.

Previous tic tac toe research demonstrates speaking improvements: Agustia & Amri (2013) found it enhanced junior high school students' speaking ability and vocabulary comprehension; Hidayati & Bahri (2015) confirmed significant effects via experimental design with 40 students assessed by rubric-scored recordings' while Hijjah et al., (2021) showed the increasement of grade 8 vocabulary achievement and active participation among 31 low-achievers. These studies validate game-based media for language skills, through varying in focus (speaking, grammar and vocabulary), supporting the present examination of tic tac toe for Thai elementary speaking development.

3. METHOD

This study employed a pre-experimental one-group pre-test and post-test design to investigate the effect of using Tic-Tac-Toe games on students' speaking skills. A quantitative approach was used to analyze the data statistically. the design involves one group that receives a pre-test, a treatment, and a post-test, allowing for comparison of performance before and after the intervention.

The study was conducted at Ban Elerd school, located in Phukradueng District, Loei, Thailand, during the 2024/2025 academic year. The population consisted of all 256 students enrolled in the school. The sample was one fifth-grade class consisting of 17 students, selected through purposive sampling. This class was chosen because the researcher was conducting a four months internship at the school, which allowed for consistent observation and instruction throughout the study.

Table 1. Rubric Score.

Classification	Score Range	Criteria
Excellent	9.6 – 10	Very understandable, highly smooth
Very Good	8.6 – 9.5	Very understandable, very smooth
Good	7.6 – 8.5	Effective, good smoothness
Fairly Good	6.6 – 7.5	Sometimes hasty, fairly smooth
Fair	5.6 – 6.5	Sometimes hasty, fair smoothness
Poor	3.6 – 5.5	Hasty, inappropriate smoothness
Very Poor	0.0 – 3.5	Very hasty, little or no communication

The instrument used in this study was a speaking test adapted from Layman (in Djabir, 2014), scoring pronunciation and fluency on a 0-10 scale across seven categories from excellent (9.6-10: highly smooth and very understandable) to very poor (0-3.5: no communication). Audio-recorded picture description tasks using a food theme provided standardized data collection, capturing students' speaking performance for both pretest and posttest. This numerical approach enabled reliable pre and post comparison to evaluate tic tac toe effectiveness, with proper instrument validation ensuring data quality and minimizing subjectivity in assessing speaking ability improvements. The rubric's clear criteria directly measured core speaking components essential for determining the intervention's impact on Thai elementary student' oral proficiency.

4. RESULT AND DISCUSSION

The pre-test was conducted on August 21, 2024 to assess students' speaking skills before the treatment. Students were shown a picture (e.g., a cake) and asked simple questions related to the picture, including naming the object, describing its color, and expressing their preferences. The pre-test results served as the baseline for evaluating students' speaking ability.

The treatment was carried out over three sessions on August 28 September 3, and September 10, 2024. The Tic Tac Toe game was used as an interactive method to enhance speaking practice based on food-related themes. In the first session, students focused on describing food in terms of taste, texture, and color. In the second session, they expressed likes and dislikes. In the third session, they combined both aspects, encouraging more detailed speaking responses. The game required students to describe food items in order to mark a squares on the board, which encouraged their communication, vocabulary use and active participation in a fun setting.

The post-test was held on September 18, 2024 using slightly varied questions from those in the pre-test to assess improvements in vocabulary, fluency, and pronunciation. The

format remained similar, with students describing food and expressing preferences. The post-test scores were then compared with the pre-test results to evaluate the effectiveness of the game-based approach.

Table 2. Descriptive Statistics Analysis.

Statistics		Pretest	Post-test
N	Valid	17	17
	Missing	0	0
Mean		3.1235	3.8588
Median		3.0000	3.6000
Mode		2.00 ^a	2.00
Std. Deviation		.83929	1.46461
Skewness		-.367	.196
Std. Error of Skewness		.550	.550
Kurtosis		-1.573	-1.309
Std. Error of Kurtosis		1.063	1.063
Range		2.00	4.00
Minimum		2.00	2.00
Maximum		4.00	6.00
Sum		53.10	65.60

a. Multiple modes exist. The smallest value is shown

The pretest mean was 3.1235, which is lower than the post-test mean of 3.85888, indicating an increase in scores from pre-test to post-test. The medians confirm with a pretest median of 3.000 and a post-test median of 3.6000. This means that half of pretest scores were below 3.0, while half of the post-test scores were below 3.6, further indicating an improvement reflected in the higher mean and median scores. The mode for both datasets is 2.00, indicating that "2" is the most frequently occurring score in both the pre-test and post-test. Although the mode is the same, the higher mean and median in the post-test indicate that the distribution of points has shifted towards higher values. The standard deviation results also show a difference in the spread of the data, with the standard deviation in the pre-test being 0.83929 compared to 1.46461 in the post-test. The increase in standard deviation in the post-test indicates that the data in the post-test is more diverse or dispersed than in the pre-test. Overall, the increase in the mean and median and the increase in variance in the post-test suggest that there is a wider range of results between participants in the post-test, leading to improved scores.

The standard deviation for the pretest is 0.83929, but increases to 1.46461 for the post-test, indicating a higher variance in the post-test values. This suggests that participants' responses are more diverse after the post-test than after the pretest. Regarding skewness, the pretest skewness value of -0.367 indicates a slight left skewness, indicating that some values are below the mean. Conversely, the post-test skewness is 0.196, indicating a slight right skewness with small positive values. This change from negative to positive skew reflects a movement of the distribution towards higher values at the post-test. The kurtosis values for

both tests are negative (-1.573 for the pre-test and -1.309 for the post-test), indicating that both distributions are relatively flat or plate-like. This flatness means the values are reasonably distributed around the mean, with few extreme outliers.

Overall, the changes in standard deviation, skewness, and kurtosis from pre-test to post-test indicate that the distributions after the post-test are broader and have a shift towards higher values, with a roughly uniform spread of responses in both cases and minimal extreme values tests.

Table 3. Normality Test.

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.204	17	.059	.811	17	.003
Post-test	.177	17	.163	.889	17	.045

a. Lilliefors Significance Correction

Kolmogorov-Smirnov and Shapiro-Wilk provide different interpretations regarding the distribution of the data. For the Kolmogorov-Smirnov test, the statistic for the pretest data is 0,204 with p-value of 0,059, whereas the statistic for the post-test data is 0,177 with a p-value of 0,613. Both p-values are greater than 0,05, which indicates that the pretest and post-test data have no signification deviation from normal distribution according to the Kolmogorov-Smirnov test. Therefore, based on the Kolmogorov-Smirnov test, it is assumed that the pretest and post-test data follow normal distributions. However, different results were observed for the Shapiro-Wilk test. The Shapiro-Wilk test is generally more sensitive for small samples. The pre-test data shows a statistical value of 0,811 (p-value 0,003) and the post-test data shows a statistical value of 0,889 (p-value 0,045). Both p-values are less than 0,05, especially for the pretest data, where the p-value is lower, indicating a significant deviation from normal distribution. Based on the Shapiro-Wilk test, both pretest and post-test data appear to be non-normally distribute, especially the pre-test, with larger deviation.

The researcher selected the t-test based on the results of the Kolmogorov-Smirnov test, which revealed that neither the pre-test ($p = 0.059$) nor the post-test data ($p = 0.163$) deviated significantly from the pre-test data, which is normally distributed. This supports the assumption of normal distribution required for the t-test. Although the Shapiro-Wilk test is more sensitive with smaller samples, it showed significant values (pre-test $p = 0.003$; post-test $p = 0.045$) and indicated some deviation, but the t-test is known to be robust against minor violations of normal distribution. Furthermore, the t-test remains a reliable choice for moderate sample sizes ($n > 15$). Therefore, the t-test was deemed appropriate to accurately assess the differences between pre-test and post-test results.

Table 4. Paired Sample Test.

Pair	Mean	Std. Deviation	Paired Samples Test			t	df	Sig. (2-tailed)
			Std. Error Mean	95% CI Lower	95% CI Upper			
Pretest - Posttest	-0.73529	1.06884	0.25923	-1.28484	-0.18575	-2.836	16	0.012
Vocabulary - Vocabulary2	-0.94118	1.59963	0.38797	-1.76363	-0.11872	-2.426	16	0.027
Pronunciation - Pronunciation2	-0.72941	1.44731	0.35102	-1.47355	0.01473	-2.078	16	0.054
Fluency - Fluency2	-1.38824	1.58346	0.38405	-2.20238	-0.57409	-3.615	16	0.002

The results of the paired samples t-test demonstrate the significant effectiveness of using Tic-Tac-Toe game in enhancing students' speaking skills. Overall, there as notable improvement in the students' performance, as reflected in the mean difference between the pre-test and post-test scores of -0.73529 ($t = -2.836$, $p = 0.012$). this statistically significant result confirms that the Tic-Tac-Toe game had a positive impact on students' overall speaking ability. When examining specific aspects of speaking, vocabulary showed a significant improvement, with a mean difference of -0.94118 ($t = -2.426$, $p = 0.027$). This finding indicates that the interactive nature of the game successfully facilitated the expansion and application of new vocabulary, particularly in the context of food-related discussions that were central to the activity.

The most remarkable improvement was observed in the fluency aspect, where the mean difference reached -1.38824 ($t = -3.615$, $p = 0.002$). This highly significant result highlights the ability of the Tic-Tac-Toe game to create an engaging and low-pressure environment that encouraged students to speak more naturally and confidently. This repetitive yet dynamic structure of the game allowed students to practice forming sentences and expressing their ideas without fear of making mistakes, which likely contributed to their increased fluency.

In contrast, the improvement in pronunciation, while present, was not statistically significant. The mean difference of -0.72941 ($t = -2.078$, $p = 0.054$) suggests that while the game contributed to some progress in this area, it may not have provided enough targeted practice to achieve a substantial impact. This finding implies that additional focused activities, such as drills exercises, might be necessary to address pronunciation challenges more effectively.

Overall, the results strongly support the effectiveness of Tic-Tac-Toe game as a tool for enhancing speaking skills, particularly vocabulary acquisition and fluency. The game with interactive and engaging design created an environment that not only motivated students to participate but also provided opportunities for meaningful language use. While the

improvement in pronunciation were less pronounced, the overall findings underscore the potential of game-based learning strategies to foster significant language development enjoyably and inclusively.

Hypothesis Testing

(H0): The use of the Tic-Tac-Toe game is not effective in improving the speaking skills of the fifth-grade students of Ban Elerd

(H1): The use of the Tic-Tac-Toe game is effective in improving the speaking skills of the fifth-grade students of Ban Elerd.

Based on the paired sample test results, the overall speaking skills of the students showed significant improvement. The mean difference was -0.735, with a p-value of 0.012, which is less than the significance level of 0.05. Therefore, the null hypothesis (H0) was rejected, indicating that Tic-Tac-Toe significantly improved the students' overall speaking abilities. For vocabulary, the paired sample test revealed was rejected, a mean difference of -0.941 and a p-value of 0.027. Since the p-value was below 0.05, the null hypothesis (H0) confirming that Tic-Tac-Toe significantly enhance the students' vocabulary. Similarly, the results for fluency showed a mean difference of -1.388 and a highly significant p-value of 0.002. This also led to the rejection of the null hypothesis (H0), demonstrating that the game had a strong positive effect on students' fluency.

However, the findings for pronunciation differ slightly. While there was a mean difference of -0.729, the p-value was 0.054, slightly above the 0.05 threshold for statistical significance. As a result, the null hypothesis (H0) could not be rejected for pronunciation, suggesting that the improvement in this area was not statistically significant. In conclusion, the hypothesis testing demonstrated that the use of Tic-Tac-Toe as a game-based learning tool significantly improved the overall speaking skills, vocabulary and fluency of the students. Although there was an upward trend in pronunciation, it did not reach the level of statistical significance. These findings confirm the effectiveness of Tic-Tac-Toe in enhancing key aspects of speaking skills, particularly vocabulary and fluency

Discussion

The findings in Chapter IV highlight the positive effects of the tic-tac-toe game intervention on various aspects of the speaking skills of the fifth graders at Ban Elerd School, especially general speaking ability, vocabulary, and fluency. Quantitative analysis comparing pre-test and post-test results showed clear improvements. The mean score increased from 3.12 (pre-test) to 3.86 (post-test), and the variability of scores also increased. This analysis showed

significant improvements in these areas, demonstrating the potential of the game as an effective tool for language learning.

Normality tests gave mixed results: The Kolmogorov-Smirnov test suggested a normal distribution of the pre-test and post-test data, while the Shapiro-Wilk test showed some deviations, probably due to the sensitivity of the sample size. Despite these inconsistencies, the t-test was considered appropriate, as it remains robust to medium-sized samples and supports reliable statistical conclusions. Looking at the specific effects, paired samples t-tests showed significant improvements in general speaking ability, vocabulary and fluency.

For general speaking ability, the mean difference of -0.735 ($p = 0.012$) confirmed that the game-based intervention significantly improved general speaking ability. This was further supported by an increase in score variability, suggesting that students became more diverse and confident in their responses. The paired sample t-test results confirmed that these improvements were statistically significant in certain areas, highlighting the game's effectiveness in boosting students' engagement with language and promoting active use of new vocabulary and fluent speech.

Vocabulary scores also showed a significant improvement with a mean difference of -0.941 ($p = 0.027$), supporting the effectiveness of tic-tac-toe in increasing students' vocabulary size and usage. The game's requirement for students to describe and communicate using a variety of terms fostered an environment rich in vocabulary practice. These results are consistent with the literature highlighting the benefits of game-based learning for vocabulary acquisition by engaging students in engaging, vocabulary-rich activities (Agustia & Amri, 2013; Liu et al., 2021). Recent research by (Ellis & Wulff, 2020) highlights the importance of encountering vocabulary in meaningful contexts, confirming that game-based learning supports vocabulary retention by providing students with memorable and engaging experiences. Similarly, (Ellis & Wulff, 2020) emphasize that usage-based approaches, like those implemented in Tic-Tac-Toe, promote vocabulary learning by exposing students to words in diverse and meaningful interactions.

Although pronunciation showed a trend toward improvement (mean difference of -0.729, $p = 0.054$), the change was not statistically significant, suggesting that additional targeted practice may be needed to comprehensively address this skill. Pronunciation development often relies on explicit and focused instruction, including auditory feedback and detailed practice of phonetic distinctions, which are not typically emphasized in game-based activities (Foote et al., 2016). The limited improvement in pronunciation can be attributed to the nature of game-based learning, which often prioritizes communication and vocabulary over

detailed phonetic accuracy. The emphasis on fluency and communication in game-based learning, while beneficial for vocabulary and fluency, may inadvertently limit attention to pronunciation, explaining the modest gains observed.

In contrast, fluency increased highly significantly with a mean difference of -1.388 ($p = 0.002$). This reflects the game's ability to promote self-confidence and spontaneous language, which is consistent with previous research linking game-based learning with increased student engagement and reduced conversation anxiety (Ng et al., 2021). The low-pressure environment fostered by the game enabled students to speak without anxiety, allowing them to become more comfortable and confident in their language use. This finding is consistent with research by (Grimshaw & Cardoso, 2018), which demonstrated that game-based learning can enhance fluency through repeated and spontaneous language practice.

The finding suggests that while the Tic-Tac-Toe game is an effective tool for enhancing vocabulary and fluency, it may need to be supplemented with more focused pronunciation exercises to foster balanced speaking skills. Integrating explicit training and providing individualized feedback alongside game-based activities could lead to more comprehensive language development. Recent literature supports the idea that combining structured pronunciation activities with interactive and engaging methods can optimize learning outcomes, ensuring improvements across all aspects of language proficiency (Grimshaw & Cardoso, 2018; Lee & Lee, 2021).

In conclusion, the Tic-Tac-Toe intervention proved effective in developing vocabulary and fluency, confirming the value of interactive learning in language education. However, the limited effect on pronunciation underscores the need for a diverse instructional approach that balances engagement with focused practice. These findings are in line with broader research emphasizing the need for rich, contextually varied learning environments to achieve comprehensive language proficiency (Saito & Plonsky, 2019; Vnucko & Klimova, 2023).

5. CONCLUSION

This study investigated the effectiveness of tic tac toe game-based learning on speaking skills among fifth-grade students at Ban Elerd School. Results demonstrated significant overall speaking improvement, particularly in vocabulary and fluency, as confirmed by paired sample t-test analysis. The t-test revealed statistically significant gains in general speaking ability (mean difference = -0.735, p -value = 0.012), vocabulary development (mean difference = -0.941, p -value = 0.027), and fluency (mean difference = -1.388, p -value = 0.002),

verifying the intervention's impact. Pronunciation showed modest progress (mean difference = -0.729, p-value = 0.054) but lacked statistical significance, indicating supplementary targeted instruction may be needed. These findings validate tic tac toe as an effective instructional tool, especially for enhancing vocabulary and fluency in elementary RFL contexts.

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