A Microlearning-Based Digital Storytelling Model to Enhance English Speaking Skills

Kanyakorn Tammati[1], Potsirin Limpinan[1,*] & Thada Jantakoon[1]

[1]Faculty of Science and Technology, Rajabhat Mahasarakham University, Thailand

*Correspondence: Potsirin Limpinan, Faculty of Science and Technology, Rajabhat Mahasarakham University, 80 Nakonsawan Rd, Mahasarakham, Thailand. E-mail: potsirin.li@rmu.ac.th. ORCID: https://orcid.org/0000-0002-0748-1965

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Abstract

This study aimed to develop a microlearning-based digital storytelling instructional model (MICRO-DST) to enhance English speaking skills among Grade 9 EFL students and to examine its implementation effects. Employing a research and development methodology with a one-group pretest–posttest quasi-experimental design, the study selected a sample of 35 students from a population of 383 at Seka School, Thailand, via cluster sampling. The model was developed through a systematic synthesis of 14 studies published between 2019 and 2025 and validated by five experts. The resulting model consists of three core elements: conceptual foundations, six instructional components, and a five-step learning process. Data from a rubric-based English-speaking assessment were analyzed using descriptive statistics, dependent-samples t-test, and Cohen's d effect size. Expert evaluation indicated the highest level of model appropriateness ($M = 4.56$, $SD = 0.52$). The findings revealed that students' posttest speaking scores ($M = 14.52$, $SD = 2.92$) were significantly higher than their pretest scores ($M = 10.61$, $SD = 2.94$), $t(34) = 8.92$, $p < .001$. The effect size was remarkably large (Cohen's $d = 1.51$), with students demonstrating a 47.60% overall proficiency gain across all five CEFR speaking dimensions, led by language Range (51.0%). These findings indicate that the MICRO-DST model effectively enhances multidimensional speaking proficiency and offers a practical instructional innovation for secondary EFL education.

Keywords: CEFR, digital storytelling, EFL learners, English speaking skills, microlearning

1. Introduction

The 21st century has brought significant changes to education worldwide, largely driven by rapid advances in digital technology. In Thailand, these changes are reflected in national policy frameworks such as the 20-Year National Strategy (2018–2037) and the National Scheme of Education B.E. 2560–2579 (2017–2036). These policies emphasize human capital development, lifelong learning, equitable access to quality education, and the development of competencies needed for work and life in a rapidly changing society. Accordingly, there is a growing need to design learning environments that are flexible, accessible, and aligned with the demands of the digital era.

Among these competencies, English speaking is particularly important for Thai learners in a globalized society. The Common European Framework of Reference for Languages (CEFR) has been adopted as a national benchmark, with Grade 9 students expected to achieve at least A2 level in speaking (Council of Europe, 2020). However, developing speaking skills remains a challenge in practice. Many Thai classrooms still emphasize grammar and reading for examinations rather than communicative use of language (Wongsothorn et al., 2020). As a result, many students lack confidence and struggle to communicate in English naturally.

Today's learners, often referred to as digital generation students, differ from previous generations in their learning preferences. They tend to prefer short and focused learning activities and typically maintain attention for only 10–15 minutes (Bradbury, 2016). In contrast, content-heavy instruction may reduce learner engagement and motivation (Wongdaeng, 2025). These conditions highlight the need to redesign instruction so that learning becomes more concise, engaging, and suitable for digital environments familiar to students.

Two instructional approaches that may address these challenges are microlearning and digital storytelling. Microlearning delivers content in small, focused units, usually within 5–10 minutes, which supports memory retention and reduces cognitive load (Alias & Razak, 2024; Hosseini et al., 2020). Digital storytelling integrates multimedia elements such as images, audio, video, and text to create meaningful narratives that enhance learner engagement (Lambert, 2022; Robin, 2016). Previous studies also suggest that integrating these two approaches can improve speaking performance, confidence, and willingness to communicate in English (Prasittichok & Smithsarakarn, 2024; Yang et al., 2020).

However, there is still limited research on the integration of microlearning and digital storytelling into a single instructional model for developing English speaking skills at the secondary level. Most existing studies have examined these approaches separately, with less attention given to their combined application in developing multiple dimensions of speaking ability, including fluency, accuracy, interaction, range, and coherence (Council of Europe, 2020).

This study was guided by two primary research objectives 1) to develop a microlearning-based digital storytelling model (MICRO-DST) for enhancing Grade 9 students' English-speaking skills; and 2) to examine the effects of implementing the MICRO-DST model on students' English-speaking performance.

2. Literature Review

2.1 Microlearning in Language Education

Microlearning is an instructional approach delivering content in short, focused units (5-10 minutes) to reduce cognitive load and enhance retention (Alias & Razak, 2024; Hosseini et al., 2020). Grounded in Cognitive Load Theory (Sweller et al., 2019), it enables effective information processing through manageable segments (Taylor & Hung, 2022). In language education, microlearning addresses digital natives' shortened attention spans and preference for mobile learning (Coursera, 2024). A meta-analysis by Prasittichok and Smithsarakarn (2024) revealed significant effects of microlearning on EFL speaking skills, with platforms like TikTok and YouTube enhancing motivation and reducing speaking anxiety. Key characteristics include bite-sized content, diverse formats, ubiquitous access, and embedded assessments (Ning et al., 2024).

2.2 Digital Storytelling for Speaking Development

Digital storytelling (DST) combines multimedia elements images, audio, video, and text to create engaging personal narratives (Lambert, 2022; Robin, 2016). DST provides authentic language contexts, enhances motivation, and promotes creative expression (Robin, 2016). A systematic review by Nair and Yunus (2021) found consistent evidence that DST improves speaking skills, confidence, and idea organization. Yang, Chen, and Hung (2020) demonstrated that DST projects significantly enhanced students' speaking abilities and creative thinking. Recent studies confirm DST's effectiveness across educational levels (Du et al., 2024; Fu et al., 2021; Zhussupova & Shadiev, 2023; Azqiya, 2025), with benefits including improved fluency, accuracy, and classroom participation.

2.3 English Speaking Skills Framework

The Common European Framework of Reference for Languages (CEFR) identifies five essential dimensions of speaking proficiency at the A2 level: Range, Accuracy, Fluency, Interaction, and Coherence (Council of Europe, 2020). These dimensions represent the core competencies required for effective spoken communication in English as a Foreign Language (EFL) context. Previous studies indicate that successful speaking performance requires the integration of linguistic accuracy, lexical diversity, and fluency to achieve communicative goals (Sha'ar & Boonsuk, 2021). However, Thai EFL learners often experience difficulties in developing these competencies due to limited opportunities for authentic communication practice and high levels of speaking anxiety (Parichatnon, 2023).

Although considerable research has explored the use of microlearning and digital storytelling in language education, these approaches have largely been investigated independently. Microlearning has been recognized for its potential to enhance learner engagement and facilitate focused language practice through short, goal-oriented learning units (Prasittichok & Smithsarakarn, 2024). Meanwhile, digital storytelling has been widely reported to support language development by encouraging learners to organize ideas, construct narratives, and communicate meaning through multimedia expression (Nair & Yunus, 2021; Yang et al., 2020). Despite these benefits, few studies have systematically integrated microlearning and digital storytelling into a comprehensive instructional model designed to simultaneously develop multiple dimensions of speaking proficiency.

Furthermore, existing studies often emphasize isolated aspects of speaking development without providing structured, step-by-step instructional frameworks that explicitly connect learning activities with specific speaking skills. Recent

research by Du et al. (2024) and Zhussupova and Shadiev (2023) highlights the need for more integrated pedagogical approaches that combine innovative digital learning strategies with communicative language teaching principles. Addressing this gap, the present study proposes the MICRO-DST model, which integrates microlearning and digital storytelling within a structured instructional framework aimed at developing all five CEFR speaking dimensions. This approach responds to the growing need for pedagogical models that prepare EFL learners for authentic communication in increasingly digital learning environments.

3. Method

3.1 Research Design

This study employed a research and development (R&D) methodology combined with a one-group pretest-posttest quasi-experimental design. The research was conducted in two main phases: (1) the development and validation of the MICRO-DST instructional model, and (2) the implementation and evaluation of the model's effectiveness in enhancing English speaking skills.

3.2 Participants

The population of this study consisted of 383 ninth-grade students from 10 classrooms at Seka School, Seka District, Bueng Kan Province, Thailand. The sample was selected using cluster sampling, resulting in one intact classroom of 35 students (18 males, 17 females) aged 14-15 years. All participants were Thai native speakers learning English as a foreign language (EFL) and had studied English for approximately 8-9 years prior to the study. The sample size of 35 exceeded the minimum requirement of 30 participants for paired samples t-test to maintain robustness against violations of normality assumptions (Pallant, 2020).

3.3 Research Instruments

The MICRO-DST model was developed through a systematic synthesis of relevant literature and research. The model comprises three interconnected components: (1) instructional components, (2) a five-stage learning process, and (3) five dimensions of English-speaking proficiency. The instructional components include microlearning, digital storytelling, collaboration, scaffolding, video-based learning, and reflection with feedback. These components are implemented through a five-stage learning process consisting of Input, Notice, Prepare Script, Rehearse, and Reflect and Improve to develop learners' coherence, interaction, fluency, accuracy, and range in English speaking.

Based on the model, four lesson plans were developed, each requiring 2 hours of instruction (total 8 hours). The lesson topics were selected based on their relevance to students' daily lives and alignment with CEFR A2 level: (1) Greetings, (2) Weather, (3) Health Problems, and (4) Giving Directions.

Figure 1. Example of a Microlearning Instructional Video on Greetings Developed for the MICRO-DST Model

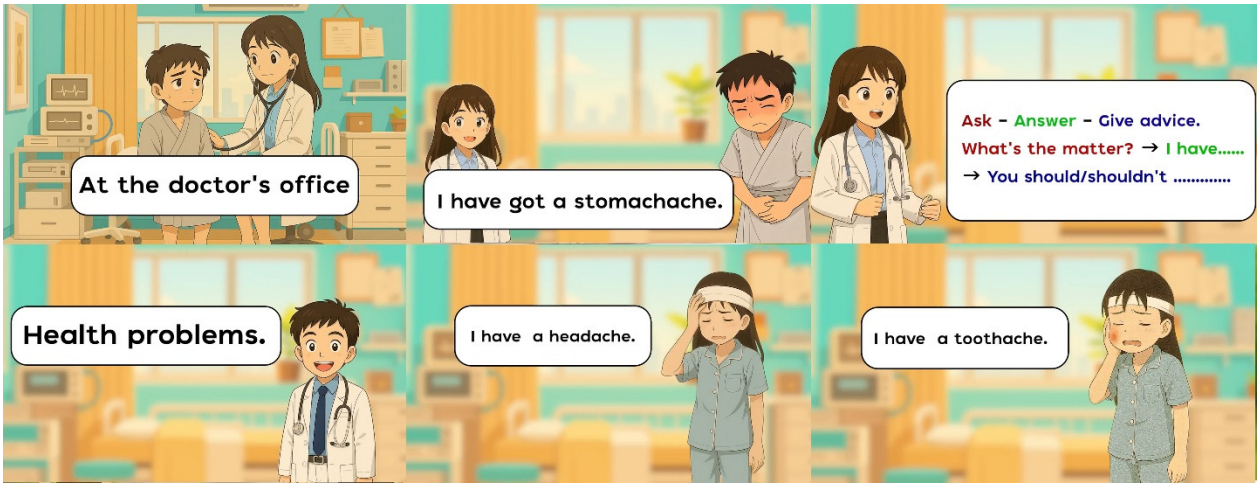

Figure 2. Example of a Microlearning Instructional Video on Health Problem Developed for the MICRO-DST Model

Each lesson incorporated microlearning videos created through a 3P production process (Pre-Production, Production, Post-Production). The videos featured 3D animated characters and presented digital stories lasting 1-3 minutes, with accompanying transcripts, vocabulary banks, and model dialogues. The videos were designed to be accessible via smartphones and other mobile devices, supporting anytime-anywhere learning. Examples of the microlearning instructional materials are presented in Figures 1 and 2. The complete video is available via the YouTube link provided in the figure caption (https://www.youtube.com/@kanyakornTT).

3.4 Procedure

The research procedure was conducted over 8 weeks, divided into four phases:

Phase 1: Preparation and Planning (Week 1) – Literature review, instrument development, and lesson planning.

Phase 2: Implementation and Data Collection (Weeks 2-6) –Week 2: Pretest administration. Students were randomly paired and drew lots to select one of four situations for role-play assessment. Their performances were video-recorded and evaluated by two raters using the speaking rubric. Weeks 3-6: Instructional implementation. Students learned through the MICRO-DST model for 2 hours per week (total 8 hours), covering four topics sequentially. Each unit followed the 5-step learning process.

Phase 3: Posttest and Data Analysis (Week 7) – Posttest administration using the same procedure as the pretest, followed by data analysis.

Phase 4: Conclusion and Reporting (Week 8) – Interpretation of findings and report writing.

3.5 Data Analysis

Data was analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (paired samples t-test) to compare pretest and posttest speaking scores. The significance level was set at .05. Prior to analysis, normality was assessed using the Shapiro-Wilk test, and the robustness of the t-test was considered given the sample size (n = 35).

4. Results

4.1 Synthesis of the MICRO-DST Model

4.1.1 Synthesis of MICRO-DST Model Components

The MICRO-DST model was developed through systematic synthesis of 14 key studies (2019-2025) across three dimensions: components, learning process, and speaking skills. Table 1 presents the synthesis of model components.

Table 1. Synthesis of MICRO-DST Model Components

Component	Yang et al. (2020)	Du et al. (2024)	Fu et al. (2021)	Nair & Yunus (2021)	Zhussupova & Shadiev (2023)	Huang (2022)	Fan & Chen (2023)	Ning et al. (2024)
Microlearning	✓	✓						✓
Digital Storytelling	✓	✓		✓	✓			
Collaboration	✓	✓					✓	
Scaffolding			✓	✓	✓			
Video-Based Learning			✓	✓	✓			
Reflection & Feedback		✓			✓	✓	✓	

Table 1 presents the synthesis of key components identified from previous studies on microlearning and digital storytelling in language education. The analysis reveals six core components frequently reported in the literature, including Microlearning learning design, digital storytelling, collaboration, scaffolding, video-Based Learning and reflection and feedback. These elements collectively form the structural foundation of the MICRO-DST instructional model.

Table 2. Description of Components

Component	Description of MICRO-DST Model	Connection to 5 Skills
Microlearning (5-10 min)	Short units focusing on specific speaking goals/situations	Fluency, Accuracy
Digital Storytelling	Daily life/academic/professional topics as digital stories	Coherence, Range
Collaboration	Plan-create-critique stories collaboratively	Interaction, Coherence
Scaffolding	3-part story structure + phrase bank + model dialogues	Coherence, Accuracy
Video-Based Learning	Video/audio slides/DST apps (Toontastic, CapCut)	Fluency, Range
Reflection & Feedback	5-dimensional rubric for self/peer assessment	Accuracy, Coherence

Table 2 describes the six components of the MICRO-DST model and illustrates their connection to the five CEFR speaking skills. Each component contributes to the development of specific aspects of speaking proficiency. For example, Microlearning learning supports fluency and accuracy through focused practice, digital storytelling and video-based learning enhance coherence, fluency, and language range, scaffolding promotes coherence and accuracy, while collaboration and reflection activities strengthen interaction, coherence, and accuracy.

4.1.2 Synthesis of MICRO-DST Learning Process

Table 3. Synthesis of MICRO-DST Learning Process

Step	Yang et al. (2020)	Fu et al. (2021)	Nair & Yunus (2021)	Du et al. (2024)	Zhussupova & Shadiev (2023)	Azqiya (2025)	Huang (2022)	Fan & Chen (2023)
1. Input	✓	✓	✓					
2. Notice		✓			✓			
3. Prepare Script	✓			✓	✓			
4. Rehearse			✓	✓		✓		
5. Reflect & improve				✓	✓		✓	✓

Table 3 presents the synthesis of learning processes derived from eight studies on digital storytelling and technology-enhanced language instruction. The results identify five common instructional steps that form a progressive learning sequence, beginning with language input and culminating in story production and reflective evaluation.

Table 4. The 5-Step MICRO-DST Learning Process

Step	*Activity*	*Target Skills*
1. Input	Watch/listen to short digital stories with transcript	Coherence, Range
2. Notice	Highlight discourse markers, interaction patterns, fluent phrases	Coherence, Interaction
3. Prepare Script	Adapt script to create personal story	Accuracy, Range
4. Rehearse	Shadowing and role-play with partners	Fluency, Interaction
5. Reflect and improve	Self and peer assessment using 5-dimension rubric	Accuracy, Coherence, Range

Table 4 outlines the five-step learning process of the MICRO-DST model and its relationship with the five target speaking skills. The instructional sequence progresses from language input and guided language awareness to script preparation, speaking practice, and reflective evaluation. Each step is designed to develop specific aspects of speaking proficiency, including coherence, interaction, accuracy, fluency, and language range, through a structured and progressive learning process.

4.1.3 Synthesis of MICRO-DST Skills

Table 5. Synthesis of Speaking Skills

speaking skills	Yang et al. (2020)	Fu et al. (2021)	Nair & Yunus (2021)	Du et al. (2024)	Zhussupova & Shadiev (2023)	Huang (2022)	Fathi et al. (2024)	Azqiya (2025)	Rahimi & Fathi (2022)	Akkara et al. (2020)	Asl et al. (2024)
Coherence	✓				✓			✓			
Interaction				✓					✓	✓	
Fluency	✓	✓	✓	✓	✓						
Accuracy				✓	✓	✓					✓
Range	✓	✓			✓		✓				

Table 5 presents the synthesis of five speaking dimensions frequently addressed in previous digital storytelling studies. The findings confirm that coherence, interaction, fluency, accuracy, and range represent the primary indicators of speaking proficiency in EFL contexts.

Table 6. Synthesis of Five Speaking Skills in DST Context

Skill	Description in DST Context	Activity Design
Coherence	Clear story sequence, appropriate connective words	3-part story structure + graphic organizer
Interaction	Listen-respond, maintain conversation	Q&A after story / online comments
Fluency	Continuous speech, natural pacing	Repeated rehearsal and recording
Accuracy	Correct grammar/vocabulary sufficient for comprehension	Model scripts + form-focused feedback
Range	Varied sentence structures and vocabulary	Changing topics/genres each unit

Table 6 explains how each speaking skill is operationalized within the MICRO-DST instructional design. Specific activities such as story structuring, peer interaction, rehearsal, and feedback are integrated into the learning process to systematically develop each dimension of speaking proficiency.

4.1.4 Results of Development MICRO-DST Learning Process

The MICRO-DST (Microlearning-based Digital Storytelling) model, presented in Figure 3, was developed through a systematic synthesis of relevant literature and research. The model comprises three interconnected components: (1) instructional components, (2) a five-stage learning process, and (3) five dimensions of English-speaking proficiency.

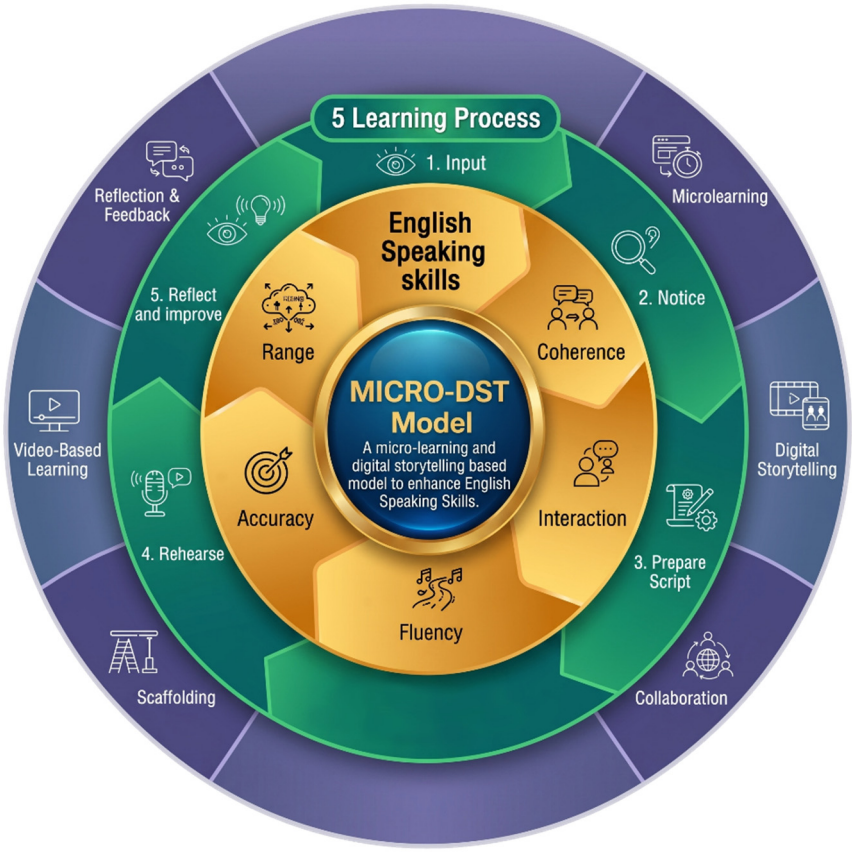

Figure 3. MICRO-DST Model

The instructional component integrates six key elements: microlearning, digital storytelling, collaboration, scaffolding, video-based learning, and reflection with feedback. These elements support a five-stage learning process consisting of Input, Notice, Prepare Script, Rehearse, and Reflect and Improve. The process begins with exposure to short digital stories, followed by language noticing, script preparation, speaking practice, and reflection with teacher and peer feedback. The cycle is repeated across learning units to support continuous improvement.

The model targets five dimensions of English-speaking proficiency: coherence, interaction, fluency, accuracy, and range. These dimensions are embedded throughout the learning process, with the instructional components providing pedagogical support and the learning stages facilitating their practical implementation. Together, the three components form an integrated framework for the systematic development of English-speaking skills.

The MICRO-DST model was evaluated by five experts in educational technology and English language teaching. Table 7 presents the expert evaluation results.

Table 7. Expert Evaluation of the MICRO-DST Model

Evaluation Aspect	$\bar{x}$	S.D.	Interpretation
1. Model Structure Accuracy	4.60	0.55	Highest
2. Digital Media & Technology Integration	4.60	0.50	Highest
3. English Speaking Skills Enhancement	4.52	0.51	Highest
4. Feasibility for Implementation	4.52	0.51	Highest
Overall	**4.56**	**0.52**	**Highest**

The expert evaluation revealed that the MICRO-DST model was rated at the highest level of appropriateness overall ($\bar{x}$ = 4.56, S.D. = 0.52), with all four aspects rated at the highest level. The highest-rated aspects were Model Structure Accuracy ($\bar{x}$ = 4.60, S.D. = 0.55) and Digital Media & Technology Integration ($\bar{x}$ = 4.60, S.D. = 0.50).

4.2 Effects of the MICRO-DST Model on English Speaking Skills

4.2.1 Comparison of Pretest and Posttest Speaking Scores

Table 8 presents the comparison of pretest and posttest English speaking scores.

Table 8. Comparison of Pretest and Posttest Speaking Scores

Test	n	Full Score	$\bar{x}$	S.D.	Mean Difference	t	df	p-value
Pretest	35	20	10.61	2.94	3.91	8.92	34	<.001
Posttest	35	20	14.52	2.92				

**Significant at the .05 level.*

The results showed that students' posttest English speaking scores ($\bar{x}$ = 14.52, S.D. = 2.92) were significantly higher than their pretest scores ($\bar{x}$ = 10.61, S.D. = 2.94) at the .05 level (t = 8.92, p < .001). The mean difference was 3.91 points, representing a 36.9% increase from the pretest mean. The results indicate substantial improvement in students' speaking performance, indicating that the MICRO-DST model had a substantial impact on students' speaking skill development.

4.2.2 Analysis of Speaking Skills by Dimension

Table 9 presents the comparison of pretest and posttest scores across the five speaking dimensions.

Table 9. Comparison of Speaking Skills by Dimension

Speaking Dimension	Pretest		Posttest		Difference	% Increase
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
1. Range	2.06	0.48	3.11	0.47	1.05	51.0
2. Accuracy	2.03	0.51	3.06	0.48	1.03	50.7
3. Fluency	2.14	0.49	3.17	0.51	1.03	48.1
4. Interaction	2.09	0.53	3.09	0.49	1.00	47.8
5. Coherence	2.19	0.47	3.08	0.50	0.89	40.6
Average	**2.10**	**0.50**	**3.10**	**0.49**	**1.00**	**47.6**

All five speaking dimensions showed improvement from pretest to posttest. The highest posttest mean score was in Fluency ($\bar{x}$ = 3.17), followed by Range ($\bar{x}$ = 3.11), Interaction ($\bar{x}$ = 3.09), Coherence ($\bar{x}$ = 3.08), and Accuracy ($\bar{x}$ = 3.06). In terms of percentage increase, Range showed the highest gain (51.0%), followed by Accuracy (50.7%), Fluency (48.1%), Interaction (47.8%), and Coherence (40.6%).

4.2.3 Hypothesis Testing

The research hypothesis stated that students who learn through the MICRO-DST model would demonstrate significantly higher posttest English speaking scores compared to their pretest scores. The results confirmed this hypothesis, with posttest scores ($\bar{x}$ = 14.52, S.D. = 2.92) significantly higher than pretest scores ($\bar{x}$ = 10.61, S.D. = 2.94) at the .05 level (t = 8.92, p < .001). Therefore, the research hypothesis was accepted.

4.2.4 Normality Test

Table 10 presents the results of the Shapiro-Wilk normality test.

Table 10. Normality Test Results

Test	*W*	p-value
Pretest	0.889	<.001
Posttest	0.902	0.004

The pretest and posttest scores showed non-normal distributions (p < .05). However, given that the sample size exceeded 30 (n = 35), the paired samples t-test was considered robust against violations of the normality assumption (Pallant, 2020), supporting the use of the test for the present analysis.

5. Discussion

The results offer empirical proof of the efficacy of the blend of microlearning and digital storytelling in language teaching. The integration is consistent with contemporary theories of learning which highlight cognitive processing, multimedia learning, and social interaction as essential elements in the acquisition of second language.

5.1 Interpretation of Results

The results of this study strongly support the efficacy of the MICRO-DST model in improving the speaking skills of ninth-grade EFL learners in English. The huge difference from pretest to posttest (t = 8.92, p <.001) with a very large effect size (Cohen's d = 1.51) indicates that the model significantly affected students' speaking skill. This section explains the findings considering the objectives of the research and past scholarship.

5.1.1 Sufficiency of the MICRO-DST Model

The suitability of the MICRO-DST model was judged at the highest level by the experts ($\bar{x}$ = 4.56, S.D. = 0.52), suggesting the high theoretical and practical validity of the model. This result agrees with more general studies stressing the necessity for systematic model construction from evidence (Yang et al., 2020; Du et al., 2024; Fu et al., 2021; Nair & Yunus, 2021; Zhussupova & Shadiev, 2023). The framework is an integrated mix of micro-learning principles and digital storytelling bundled into 3 components of Conceptual Foundation, approach Components and a 5-Step Learning Process. The conceptual foundation is based on three recognized theoretical models: microlearning that minimises cognitive load by providing content into small units (Alias & Razak, 2024; Hosseini et al., 2020), digital storytelling which provides meaningful context to use the language through storytelling (Lambert, 2022; Robin, 2016), and teaching speaking skills that emphasizes a genuine communication scenario with multidimensional proficiency development (Council of Europe, 2020).This theoretical integration addresses a gap in previous research which has attempted to analyze different techniques separately rather than in synergy.

The six Model Components (Microlearning, Digital Storytelling, Collaboration, Scaffolding, Video-based Learining, and Reflection & Feedback) are very consistent with features found in previous studies as necessary for successful language learning. The presence of collaboration and scaffolding elements is grounded in Vygotsky's (1978) sociocultural theory of learning through social interaction and the provision of appropriate support within the Zone of Proximal Development (ZPD). This aligns with the findings of Fu et al. (2021) and Nair and Yunus (2021) who highlight the importance of structured support in digital storytelling contexts.

The 5-Step Learning Process (Table 4) is a synthesis of the instructional sequences from several studies that creates a coherent pedagogical framework that moves from receptive to productive skills. The inclusion of phases such as "Produce Digital Story" and "Share and Interact" goes beyond traditional microlearning by integrating notions of learner agency and social learning that are relevant to contemporary language education (Fan & Chen, 2023; Ning et al., 2024).

5.1.2 Effectiveness in Enhancing Speaking Skills

The remarkable improvement in the pupils' speaking scores suggests the applicability of the MICRO-DST paradigm. All 35 students improved their scores from pre-test to post-test with an improvement range of 0 to 12.5 points. This result coincides with the findings of previous studies on microlearning and digital storytelling interventions. Prasittichok and Smithsarakarn (2024) reported a large overall effect of microlearning on EFL speaking skill following its effectiveness. Similarly, Nair and Yunus (2021) discovered consistent evidence of the positive effect of digital storytelling on speaking proficiency in their systematic review.

The findings suggest that microlearning and digital storytelling could be used synergistically and might have a greater impact than either method in isolation. This conclusion is consistent with the literature that advocates for the development of integrated instructional strategies that leverage the complementary characteristics of various pedagogical techniques (Prasittichok & Smithsarakarn, 2024).

5.1.3 Improvement in Specific Speaking Dimensions

The analysis of the five speaking dimensions provides an idea of which parts of speaking proficiency were influenced by the intervention. The highest mean score of posttests was reached in the Fluency ($\bar{x}$ = 3.17) which indicates the importance of the "Rehearse" stage that provided many possibilities posttesteted practice. Students practiced shadowing, role-play, and recording their experiences repeatedly, an approach that research has proven to be vital for the development of automaticity and decreased hesitancy (Yang et al., 2020; Du et al., 2024; Fu et al., 2021). Students were allowed to re-record their performances after viewing them so they could improve their delivery and boost their fluency and confidence. The listening activities, based on four different themes in the units (Greetings, Weather, Health Problems, Giving Directions), were effective in enhancing the students' linguistic repertoire as the Range showed the highest percentage increase (51.0%) from the pretest to the posttest. This finding is consistent with the design principle that units should present various themes and genres to promote lexical and syntactic variety (Yang et al., 2020; Fu et al., 2021; Fathi et al., 2024). The digital stories provided contextualized examples of language use in a variety of settings, allowing students to learn and use appropriate vocabulary and structures for each situation. Accuracy had the second highest percentage gain (50.7%) which suggests that the model scripts and focused feedback helped students to improve their grammatical and lexical accuracy. The "Prepare Script" phase allowed students to adapt sample dialogues to their own stories and the "Reflect and Improve" step provided systematic feedback via the rubric. This is consistent with the findings of Du et al. (2024), Zhussupova and Shadiev (2023), and Huang (2022) regarding the value of form-focused instruction in communicative settings. Interaction was 47.8% higher, indicating that learning is a shared process. During rehearsal, students worked in pairs, shared their digital stories and commented on each other's work. These activities offered genuine possibilities for meaningful conversation, which contributed to the development of interactive competence as defined by Canale and Swain (1980). This is in line with the findings of Akkara et al (2022) and Rahimi and Fathi (2020) suggest that technology-mediated engagement enhances speaking skills and willingness to communicate. The coherence measure yielded the least but still significant improvement (40.6%). Students were guided to logically organize their ideas with the help of a three-part story structure (beginning-middle-end) and visual organizers. The significantly lower improvement in this measure might be due to the complexity of story structuring, which requires higher-order cognitive skills that could be cultivated over longer periods (Yang et al., 2020; Zhussupova & Shadiev, 2023). That said, the jump from 2.19 to 3.08 is a real improvement on the students' part to generate coherent narratives.

5.2 Theoretical Implications

This work makes important contributions to the theoretical understanding of language learning. They encourage the inclusion of cognitive and sociocultural aspects in instructional design. The microlearning aspect tackles cognitive load considerations, while the collaborative and story aspects extend social and contextual factors that drive learning and give opportunities for meaningful language use. This is in line with current theoretical perspectives in second language acquisition which stress cognitive processing together with social engagement (Ellis, 2015). Second, the research provides empirical support for the application of concepts of multimedia learning (Mayer, 2009) in language instruction. The digital stories integrated words, visuals and sounds in a manner that was easier to understand and remember, consistent with Mayer's dual-channel processing theory. The 3D animated characters were an interesting feature which kept the attention and motivation of the students. Third, the research highlights the importance of systematic instructional design in converting theoretical principles into actual education. The MICRO-DST model offers a coherent framework that teachers can use but it is flexible enough to adapt to varied circumstances and learner demographics. The direct link of each part and stage to specific speech features enables teachers to see the teaching reason behind activities.

5.3 Practical Implications

The findings have some practical consequences for the teaching of English language. The MICRO-DST model first provides a realistic solution to the problems of teaching speaking in large EFL classes. Short films allow students to access material on their own, so class time can be used for interactive practice. The structured phases provide clear guidance for both teachers and students and reduce the ambiguity that typically accompanies communication activities. Secondly, the concept underscores the potential for technology integration in language teaching in resource-poor settings. The digital stories were intended to be accessed via cellphones, which are available even in rural areas. Sharing and interaction via free platforms like YouTube and Google Classroom greatly reduces the barriers to adoption. Thirdly, the assessment rubric provides a practical tool for assessing speaking skills along a range of dimensions. The five-category structure, mapped to CEFR A2 level, enables teachers to provide focused feedback and monitor student progress over time. Self and peer assessment increases learner autonomy and metacognitive awareness.

5.4 Limitations

There are various limitations to this study that need to be noted. First, the one-group pretest-posttest design does not have a control group and hence restricts causal inferences regarding the effectiveness of the intervention.While a substantial impact size and consistently improved performance of all students suggest real learning gains, further work should utilize experimental designs with control groups to support causal claims.Second, the sample was from one school in one province of Thailand, which limits the generalizability of findings to other situations.Students from different locations or education systems may respond differently to the intervention.Future work should test the model effectiveness in different scenarios.Third, the study lasted only 8 hours (4 weeks), which is a somewhat short period to examine skill growth over the long run. Immediate posttest increases were large, but whether these gains would be maintained over time is uncertain. Longitudinal studies with delayed posttests are needed for retention. Fourth, the speaking assessment was conducted based on raters' evaluation which, although attempts were made to assure reliability ($r = 0.998$), might be subject to some subjectivity. Future work might use automatic voice analysis methods to enhance human judgments. Fifth, the study did not explore possible moderating variables, such as learner motivation, prior English ability, or access to technology that could influence the effectiveness of the intervention. Future research should investigate these characteristics to gain a better understanding of when and for whom the model works best.

5.5 Comparison with Previous Research

The findings of this study broadly support earlier research on microlearning and digital storytelling, while extending it in numerous ways. The considerable improvement in speaking skills is in line with the meta-analytic findings of Prasittichok and Smithsarakarn (2024) who reported SMD = 1.43 for microlearning interventions. The impact size of this study (Cohen's $d = 1.51$) is larger than usual, which could be explained by the combined strategy and the structured 5-step process. The improvement across all five speaking characteristics supports the multidimensional definition of speaking proficiency in the CEFR framework (Council of Europe, 2020). Previous research has tended to focus on total speaking ability, or selected characteristics. This study shows evidence of differential impacts across dimensions with notable gains in Fluency and Range. Furthermore, the study contributes to earlier studies by merging microlearning and digital storytelling into a holistic instructional model instead of approaching them independently. Although the effectiveness of digital storytelling has been demonstrated by Yang et al. (2020), Du et al. (2024), and Fu et al. (2021), and the evidence for microlearning has been synthesized by Prasittichok and Smithsarakarn (2024), few studies have systematically combined these approaches with explicit attention to all five speaking dimensions.

5.6 Contribution to Research

The study provides three major contributions to the field of technology accelerated language learning. Firstly, it presents the MICRO-DST model as a pedagogical approach that guides the structuring of microlearning and digital storytelling for building speaking abilities. Second, the study is empirically validated by experimental implementation and statistical analysis of the model. Third, the research offers practical guidelines for teachers by trying specific learning activities to the development of speaking skills according to CEFR.

6. Conclusion

This study developed and evaluated the MICRO-DST (Microlearning-based Digital Storytelling) model, an instructional framework designed to enhance the English-speaking skills of ninth-grade EFL students. Developed

through a systematic synthesis of relevant literature and research, the model comprises three interconnected components: (1) instructional components, (2) a five-stage learning process, and (3) five dimensions of English-speaking proficiency. The instructional components include microlearning, digital storytelling, collaboration, scaffolding, video-based learning, and reflection with feedback. These components are implemented through a five-stage learning process consisting of Input, Notice, Prepare Script, Rehearse, and Reflect and Improve, with the aim of developing learners' coherence, interaction, fluency, accuracy, and range in English speaking. The model was subsequently evaluated by five experts in educational technology and English language teaching.

The evaluation of the model yielded an excellent rating on all measures from expert judgement ($\bar{x}$ = 4.56, S.D.= 0.52). Its implementation with 35 ninth grade students resulted in a significant increase in the students' English-speaking proficiency ($t = 8.92$, $p < .001$) with a very large effect size (Cohen's $d = 1.51$). All five speaking dEnglish-speaking significant improvement, with range and accuracy improving at 51.0% and 50.7% respectively. The results indicate that microlearning and digital storytelling within a planned educational framework can significantly improve various components of speaking skills in EFL scenarios. The paradigm offers vivid principles to teachers which are practically found in theories and confront real challenges of teaching speaking in digital age classrooms. Future studies are warranted to detect the model effectiveness in heterogeneous series and examine longer-term retention, as well as moderating variables.

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Appendix A

Individual Student Score Analysis

Table A presents individual pre-test and post-test scores for all 35 students.

Table A. Individual Pretest and Posttest Speaking Scores

Student	Pretest	Posttest	Difference
1	8	12.5	4.5
2	5	14	9
3	9	12	3
4	5	8	3
5	8	8	0
6	10	11.5	1.5
7	9	14	5
8	11.5	16	4.5
9	12	13.5	1.5
10	10.5	14	3.5
11	14	18	4
12	13	15	2
13	8	15	7
14	15	18	3
15	12.5	20	7.5
16	10.5	14	3.5
17	13.5	16	2.5
18	14	17.5	3.5
19	15	15	0
20	9.5	14	4.5
21	12	18	6
22	10	12.5	2.5
23	5	17.5	12.5
24	10.5	16	5.5
25	10	14.5	4.5
26	7	16	9
27	13	16	3
28	8	10.5	2.5
29	16.5	19	2.5
30	13	16	3
31	11.5	13	1.5
32	13	16.5	3.5

Student	Pretest	Posttest	Difference
33	10	12	2
34	7	9	2
35	12	16	4
Total	**371.5**	**508.5**	**137**
Mean	**10.61**	**14.52**	**3.91**

Of the 35 students, 33 demonstrated improvement from pretest to posttest, while 2 students maintained the same scores. Individual score gains ranged from 0 to 12.5 points, with a mean gain of 3.91 points. The total speaking score increased from 371.5 to 508.5, representing an overall gain of 137 points.

In terms of proficiency levels based on the speaking assessment rubric, before instruction, most students were at the Fair level (scores 10–13), with 17 students (48.6%), followed by Needs Improvement (scores <10), with 11 students (31.4%), Good (scores 14–17), with 6 students (17.1%), and Excellent (scores 18–20), with 1 student (2.9%). After instruction, most students remained at the Fair level, with 18 students (51.4%), followed by Good, with 12 students (34.3%), and Excellent, with 5 students (14.3%). No students remained at the Needs Improvement level after the intervention.

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Authors contributions

Kanyakorn Tammati was responsible for data collection, data analysis, and drafting the original manuscript. Potsirin Limpinan, as the advisor, was responsible for study conceptualization, and critical revision of the manuscript. Thada Jantakoon, as the co-advisor, provided technical guidance throughout the research process. All authors read and approved of the final manuscript.

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Data sharing statement

No additional data are available.