Journal
of Liberal Arts
Prince of Songkla University

# A Gamified Microlearning Model: Effects on Motivation, Attitudes, and English Communication Competencies among Elementary Education Student Teachers

# ผลของการใช้รูปแบบไมโครเลิร์นนิงผสานเกมมิฟิเคชันต่อแรงจูงใจ ทัศนคติ และสมรรถนะการสื่อสารภาษาอังกฤษของนักศึกษาครูประถมศึกษา

**Received:** October 10, 2025 **Revised:** December 6, 2025 **Accepted:** December 30, 2025

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## Abstract

The increasing demand for proficient English communication competencies in elementary education highlights the need for instructional approaches that support flexible and focused learning. This study aimed to (1) examine the needs of elementary education student teachers regarding microlearning integrated with gamification, (2) develop a microlearning–gamification learning model to enhance English communication competencies of elementary education student teachers, and (3) evaluate the effects of the developed learning model on attitudes and English communication competencies of elementary education student teachers. A mixed-methods design was employed across three phases: needs assessment, model development, and implementation, involving ten student teachers at Suan Dusit University, Lampang Center. The research instruments consisted of a needs assessment questionnaire, semi-structured interview protocols, a model quality evaluation form, an English achievement test, and an attitude questionnaire. Quantitative data from the needs assessment and attitude questionnaire were analyzed using descriptive statistics, while learning achievement was examined through the Wilcoxon Signed-Rank Test. Qualitative feedback from the needs assessment, attitude questionnaire, and semi-structured interviews was subjected to content analysis to inform model refinement. Findings revealed strong preferences for communicative and task-based approaches emphasizing primary-level content, pronunciation, vocabulary, and realistic classroom scenarios. Participants valued microlearning features such as topic segmentation and frequent comprehension checks, along with gamification elements including goal clarity, scoring, and self-directed progression. The Wilcoxon analysis indicated significant

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improvement in English communication competencies after model use (Σranks = 55.00, $p < .01$). Attitude results showed very high satisfaction and motivation ($M = 4.68$, $SD = 0.55$), particularly regarding accessibility, goal clarity, and rewards. Overall, the microlearning-gamification model demonstrated strong feasibility and effectiveness in enhancing communication skills and positive attitudes among elementary education student teachers.

***Keywords:*** microlearning, gamification, English communication competencies, elementary education student teachers

## บทคัดย่อ

ความต้องการสมรรถนะการสื่อสารภาษาอังกฤษที่มีประสิทธิภาพในระดับประถมศึกษาที่เพิ่มขึ้นสะท้อนให้เห็นถึงความจำเป็นในการมีแนวทางการจัดการเรียนการสอนที่สนับสนุนการเรียนรู้อย่างยืดหยุ่นและมีจุดเน้นที่ชัดเจน การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ (1) ศึกษาความต้องการของนักศึกษาครูสาขาการประถมศึกษาเกี่ยวกับการจัดการเรียนรู้แบบไมโครเลิร์นนิงที่บูรณาการเกมมิฟิเคชัน (2) พัฒนารูปแบบการจัดการเรียนรู้แบบไมโครเลิร์นนิงร่วมกับเกมมิฟิเคชันเพื่อเสริมสร้างสมรรถนะการสื่อสารภาษาอังกฤษของนักศึกษาครูสาขาการประถมศึกษา และ (3) ประเมินผลของรูปแบบการจัดการเรียนรู้ที่พัฒนาขึ้นต่อทัศนคติและสมรรถนะการสื่อสารภาษาอังกฤษของนักศึกษาครูสาขาการประถมศึกษา โดยการวิจัยนี้ใช้ระเบียบวิธีแบบผสมผสาน 3 ระยะ ได้แก่ การประเมินความต้องการ การพัฒนารูปแบบ และการนำไปใช้จริง โดยมีผู้เข้าร่วมคือ นักศึกษาครูสาขาการประถมศึกษา จำนวน 10 คน จากมหาวิทยาลัยสวนดุสิต ศูนย์ลำปาง เครื่องมือวิจัยที่ใช้ประกอบด้วย แบบสอบถามประเมินความต้องการ แนวคำถามสัมภาษณ์กึ่งโครงสร้าง แบบประเมินคุณภาพรูปแบบ แบบทดสอบผลสัมฤทธิ์ทางภาษาอังกฤษ และแบบสอบถามทัศนคติ ข้อมูลเชิงปริมาณที่ได้จากการประเมินความต้องการและแบบสอบถามทัศนคติถูกวิเคราะห์โดยใช้สถิติเชิงพรรณนา ในขณะที่ผลสัมฤทธิ์ทางการเรียนได้รับการตรวจสอบด้วย Wilcoxon Signed-Rank ข้อมูลเชิงคุณภาพที่ได้จากการประเมินความต้องการ แบบสอบถามทัศนคติ และการสัมภาษณ์แบบกึ่งโครงสร้าง ถูกนำมาวิเคราะห์เนื้อหาเพื่อนำไปใช้ในการปรับปรุงรูปแบบ

ผลการวิจัยพบว่าผู้เรียนมีความต้องการในระดับสูงต่อแนวทางการจัดการเรียนการสอนเชิงสื่อสารและเชิงภาระงาน โดยให้ความสำคัญกับเนื้อหาในระดับประถมศึกษา การออกเสียง คำศัพท์ และสถานการณ์ในชั้นเรียนที่มีความสมจริง ผู้เข้าร่วมการวิจัยให้ความสำคัญกับคุณลักษณะของไมโครเลิร์นนิง เช่น การแบ่งเนื้อหาออกเป็นหัวข้อย่อยและการตรวจสอบความเข้าใจอย่างสม่ำเสมอ ควบคู่กับองค์ประกอบของเกมมิฟิเคชัน ได้แก่ ความชัดเจนของเป้าหมาย การให้คะแนน และการดำเนินการเรียนรู้ด้วยตนเอง การวิเคราะห์ Wilcoxon พบว่าสมรรถนะการสื่อสารภาษาอังกฤษดีขึ้นอย่างมีนัยสำคัญหลังใช้รูปแบบ (Σranks = 55.00, $p < .01$)

ผลทัศนคติแสดงความพึงพอใจและแรงจูงใจในระดับสูงมาก (M = 4.68, SD = 0.55) โดยเฉพาะด้านการเข้าถึง ความชัดเจนของเป้าหมาย และรางวัล โดยภาพรวม รูปแบบการจัดการเรียนรู้แบบไมโครเลิร์นนิงร่วมกับเกมมิฟิเคชันแสดงให้เห็นถึงความเป็นไปได้ในการนำไปใช้และประสิทธิผลในระดับสูงในการเสริมสร้างสมรรถนะการสื่อสารและทัศนคติเชิงบวกของนักศึกษาครูสาขาการศึกษาประถมศึกษา

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## Introduction

In recent years, researchers have increasingly explored gamified microlearning as an approach to support how modern learners process information and sustain motivation. By combining brief, focused learning segments with game-based features, this approach provides instruction that is cognitively manageable and emotionally engaging. Research shows that microlearning reduces cognitive overload by segmenting complex content (Leong et al., 2021), while gamification elements such as challenges and reward systems enhance motivation, engagement, and persistence (Sailer & Homner, 2020). Despite growing evidence of its effectiveness across various educational and professional context, its potential for developing pre-service teachers' English communication competencies has received limited scholarly attention. This gap is particularly relevant in English as a Foreign Language (EFL) context, where communication competence is essential for accessing academic resources and carrying out classroom instruction. Yet many learners struggle with academic vocabulary, complex syntax, and converting input into meaningful oral output (Nation, 2022). These challenges affect routine classroom communication tasks and are often intensified by cognitive overload, anxiety, and low confidence (Plass & Kalyuga, 2019), underscoring the need for approaches that address both linguistic and emotional demands.

Emotional factors also play a central role in teacher education. Anxiety, fear of evaluation, and limited communicative confidence have been shown to constrain pre-service teachers' willingness to use English. Traditional, theory heavy instruction often provides insufficient preparation for real-time communication, leaving student teachers underconfident during teaching demonstrations (Phan, 2020). Even with adequate knowledge, many struggle to apply English spontaneously, indicating a need for learning environments that foster practice and resilience. These challenges are especially pronounced in the Thai EFL context, where learners continue to report persistent difficulties in English communication despite prolonged exposure to formal instruction (National Statistical Office of Thailand [NSO], 2022). Low national proficiency rankings, together with research linking exam-oriented pedagogy to weak communicative outcomes, point to systemic limitations in prevailing instructional approaches (Khamkhien, 2010; Wongsothorn et al., 2002). For pre-service teachers, communicative tasks such as giving instructions, presenting content, and managing classroom interaction in English often trigger heightened anxiety due to limited access to authentic and supportive practice contexts (Boonchum et al., 2022; Songsirisak, 2022). These conditions suggest that pedagogical approaches should address communicative competence and affective readiness, rather than prioritizing linguistic knowledge alone.

Microlearning demonstrates considerable potential for addressing these needs, particularly through its segmented structure, which supports self-paced progression, repeated exposure, and the gradual development of learner confidence (Latorre-Cosculluela et al., 2024; Prasittichok & Smithsarakarn, 2024). When combined with gamification, microlearning may further enhance engagement by incorporating incremental rewards and low-stake challenges that encourage sustained participation. Studies conducted in EFL contexts have reported benefits such as vocabulary gains, reduced cognitive load, and improvements in speaking performance, together with high levels of learner satisfaction (Prasittichok & Smithsarakarn, 2024). However, much of the existing evidence is derived from short-term interventions or focuses on isolated language skills, often within controlled or technology-rich settings. Recent systematic reviews and meta-analyses caution that while gamification can positively influence motivation, participation, and achievement, its effectiveness is highly contingent on pedagogical alignment, contextual appropriateness, and careful management of cognitive load (Al-Khresheh et al., 2025; Luo et al., 2023; Zhang & Hasim, 2023). These findings suggest that gamification is not universally effective and that its impact depends largely on instructional design and contextual factors. Within teacher education, this concern is particularly salient, as student teachers must simultaneously manage language learning demands and professional performance expectations. Although gamification has been shown to support key language skills and higher-order learning (Su & Cheng, 2019), empirical evidence demonstrating its sustained effectiveness for developing communicative competence in pre-service teachers remains limited. To ensure systematic pedagogical alignment and contextual relevance, the development of the instructional approach in this study was conceptually guided by the ADDIE model-comprising Analysis, Design, Development, Implementation, and Evaluation, which provides a structured framework for aligning learner needs, instructional design, and learning outcomes. Overall, existing studies suggest that a gamified microlearning approach is theoretically well suited to addressing the linguistic, cognitive, and affective challenges faced by elementary education student teachers. Despite this potential, empirical studies applying this approach in Thai teacher education contexts are still limited, and few studies have systematically examined its impact on both English communication competencies and affective outcomes such as motivation and confidence. Moreover, existing studies often overlook classroom-specific communicative tasks that are central to pre-service teachers' professional practice. To address these gaps, the present study aims to (1) investigate the needs of elementary education student teachers regarding a microlearning approach integrated with gamification for developing English communication competencies, (2) design and develop a microlearning-gamification model grounded in these identified needs and explicitly aligned with classroom-based communicative tasks, and (3) evaluate the effects of the implemented model on student teachers' attitudes, motivation, and English communication performance.

## Research Questions

1.What are the needs of elementary education student teachers regarding a microlearning approach integrated with gamification?

2. How can a microlearning–gamification model be developed to effectively support student teachers' English communication competencies for classroom-based communicative tasks?

3. What are the effects of the implemented microlearning–gamification model on student teachers' attitudes, motivation, and English communication competencies?

## Literature Review

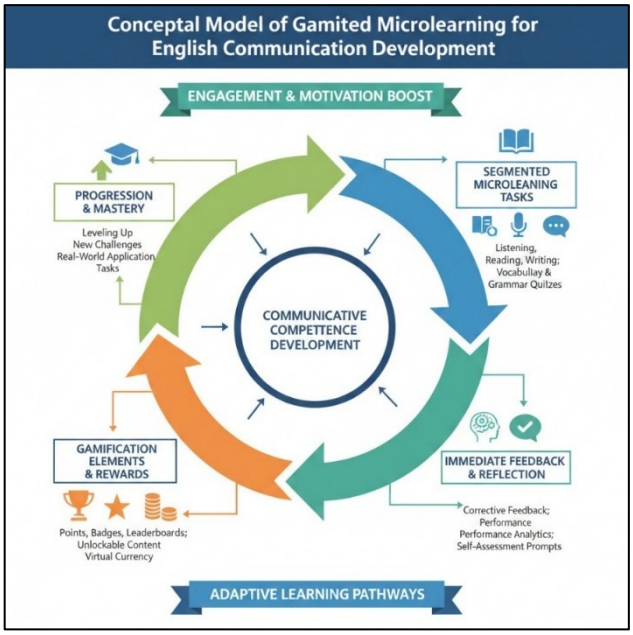
### Gamified Microlearning

Microlearning has been increasingly adopted as a pedagogical response to how contemporary learners process information and manage cognitive load. Grounded in Cognitive Load Theory, microlearning reduces extraneous cognitive burden by presenting content in small, focused segments that support attention, retention, and self-paced review (Buchem & Hamelmann, 2010; Sweller, 2011). In language learning contexts, this approach allows learners to engage with manageable units of content, revisit key concepts, and gradually build confidence through repeated exposure. Empirical evidence supports its effectiveness in EFL settings. For example, Zhang (2024) reported improvements in learners' language performance and satisfaction when microlearning modules were designed to allow frequent review and immediate application. Similarly, studies on mobile-based microlearning have demonstrated positive effects on learner engagement and self-directed learning behaviors (Bruck et al., 2012). These characteristics make microlearning particularly suitable for elementary education student teachers, who often require flexible, accessible learning formats that can be integrated into their academic and professional routines.

Gamification further enhances the effectiveness of microlearning by embedding game-based elements such as points, badges, levels, and feedback mechanisms to support motivation, persistence, and emotional engagement. Drawing on Self-Determination Theory, gamification is understood to promote learners' sense of autonomy, competence, and relatedness, thereby sustaining participation and reducing anxiety (Deterding et al., 2011; Kapp, 2012). Prior studies have shown that gamified learning environments can lower communication anxiety and encourage repeated practice, which is particularly valuable in EFL contexts where learners often hesitate to use English spontaneously (Gee, 2015; Hamari et al., 2014). When combined, microlearning and gamification offer complementary benefits, as microlearning simplifies complex language tasks into achievable steps, while gamification reinforces motivation and encourages ongoing engagement. In this study, gamified microlearning is defined as a structured instructional model consisting of four interrelated components: (1) segmented learning tasks (e.g., short vocabulary or speaking activities), (2) game-based elements (e.g., points, levels, and rewards), (3) immediate feedback and reflection opportunities, and (4) progressive challenges aligned with classroom-based communicative tasks. This model is illustrated in Figure 1, which depicts the cyclical learning process in which student teachers engage in short communicative tasks, receive feedback and rewards, and progress through increasingly challenging activities to support the development of English communication competencies, confidence, and sustained motivation.

**Figure 1**

*Conceptual Model of Gamified Microlearning for English Communication Development*




## Review of Relevant Studies

Empirical research increasingly supports the use of microlearning and gamification in language learning. Studies in EFL contexts show that short, focused learning units can improve learning gains, retention, and learner satisfaction compared with traditional instruction (Zhang, 2024), while mobile-based microlearning promotes learner autonomy and flexible, self-directed learning (Bruck et al., 2012). Research on gamification likewise highlights positive effects on motivation and affective outcomes. Gamified English instruction has been found to increase intrinsic motivation and speaking proficiency (Su & Cheng, 2019) and to reduce anxiety while strengthening confidence in oral communication (Al-Azawi et al., 2016). When game elements are meaningfully aligned with instructional goals, they can also foster sustained engagement and willingness to communicate in EFL classrooms (Hamari et al., 2014; Sailer & Homner, 2020).

Although studies integrating microlearning and gamification remain limited, emerging evidence is promising. Gamified microlearning has been shown to enhance engagement and critical thinking (Caporarello et al., 2019) and to improve communication confidence and fluency among EFL learners (Wang et al., 2024). However, important gaps persist, particularly in teacher education and the Thai EFL context. Thai learners continue to report high communication anxiety and limited opportunities for spontaneous English use, often linked to exam-oriented instruction (Songsirisak & Leung, 2022; Wongsothorn et al., 2002). Research focusing on pre-service elementary teachers is especially scarce, despite their need for classroom-specific communication skills. Few studies have examined how integrated microlearning and gamification can address both linguistic development and pedagogical readiness. To address these gaps, the present study investigates learner needs and evaluates a gamified microlearning model designed to enhance English communication skills, attitudes, and motivation among Thai pre-service elementary teachers.

## Research Methodology

### 1. Research Design

This study employed a mixed-methods research design to examine learner needs and evaluate the effectiveness of the developed learning model. Mixed-methods research is appropriate in educational studies that require both measurable outcomes and in-depth learner perspectives, as it allows quantitative and qualitative data to be interpreted together (Creswell & Plano Clark, 2018; Johnson & Onwuegbuzie, 2004). To strengthen validity, data were triangulated using surveys, achievement tests, and semi-structured interviews (Denzin, 2012).

A sequential exploratory design was used, comprising three phases: (1) needs and problem analysis, (2) model design and development, and (3) implementation and evaluation. This design is suitable when qualitative findings inform model development prior to quantitative evaluation (Creswell, 2014). The study was guided by established instructional design frameworks, including the Analysis-Design-Development-Implementation-Evaluation model (ADDIE) (Branch, 2009) and design-based research principles, which emphasize iterative development, expert review, and field testing in authentic educational settings (Reeves, 2006; Wang & Hannafin, 2005)

### 2. Research Context and Participants

This study was conducted at Suan Dusit University, Lampang Center, within the Elementary Education program. Participants were selected using purposive sampling to ensure alignment with the study's objectives and instructional context. The implementation phase involved ten second-year elementary education student teachers enrolled in the course *English Language for Elementary Education Classroom Teaching*, reflecting the actual class size in which the intervention was implemented. Small sample sizes are considered appropriate in pilot studies and instructional model development, as they allow close observation of learning processes and provide detailed feedback for model refinement (Hertzog, 2008; Van Teijlingen & Hundley, 2001). Nevertheless, the limited number of participants may constrain statistical power and generalizability; therefore, the findings should be interpreted as preliminary evidence to inform subsequent studies with larger samples. The research was conducted in multiple phases.

**Phase 1** involved undergraduate elementary education student teachers enrolled in the elementary education program, who participated in the needs assessment through questionnaires and semi-structured interviews.

**Phase 2** involved ten second-year elementary education student teachers enrolled in English Language for Elementary Education Classroom Teaching.

This context is particularly meaningful, as elementary education student teachers in Thailand often face limited opportunities to use English communicatively making it an ideal setting to explore microlearning and gamification innovations.

## 3. Design and Implementation

### Phase 1: Needs and Problem Analysis

A needs assessment questionnaire and semi-structured interviews were used to examine student teachers' English proficiency, communication challenges, and learning needs. Needs analysis is a key step in learner-centered instructional design, particularly in EFL contexts, as it ensures that instructional decisions are grounded in learners' actual difficulties (Brown, 2016; Long, 2005). The questionnaire collected demographic information, self-perceived proficiency, and learning needs, while interviews provided deeper insight into communicative obstacles, affective factors, and learner expectations. Findings from this phase informed the subsequent design of the microlearning–gamification model.

### Phase 2: Model Design and Development

The instructional model was developed based on microlearning principles and gamification frameworks. Microlearning emphasizes short, focused learning units that reduce cognitive load, while gamification incorporates motivational elements to sustain engagement (Hug, 2005; Landers, 2014). The instructional components consisted of:

- **Short instructional videos** that introduced key language concepts in concise, manageable segments
- **Interactive tasks** that allowed learners to apply concepts through immediate, hands-on practice
- **Formative quizzes** that provided instant feedback and opportunities for self-assessment
- **Pronunciation and vocabulary mini-lessons** that targeted specific communication skills through focused micro-activities

To support motivation, game mechanics such as points, levels, and optional leaderboards were integrated, as these elements have been shown to encourage participation when aligned with instructional goals (Deterding et al., 2011; Sailer & Homner, 2020).

The design process followed four iterative steps commonly described in instructional design research: storyboarding, content production, internal testing, and systematic revision (Branch, 2009). This iterative cycle ensured that both instructional components and gamified features were refined for clarity, usability, and pedagogical alignment.

Expert review was conducted with three specialists two in English language teaching and one in educational technology. They evaluated the content using the Index of Item Objective Congruence (IOC), a widely accepted method for ensuring content validity. Items scoring below 0.50 were revised accordingly.

**Phase 3: Implementation and Evaluation**

The validated model was implemented with ten student teachers. Evaluation focused on both learning achievement and learner attitudes.

- A **30-item achievement test** (four-option MCQ format) assessed English communication competencies.
- A **20-item attitude questionnaire** measured learners' perceptions of usability, engagement, and effectiveness.
- **Semi-structured interviews** captured learners' reflections and experiences.

The psychometric properties of the tools were strong:

- Achievement test: IOC = .67–1.00; KR-20 = .87, indicating high reliability.
- Attitude questionnaire: Cronbach's alpha = .92, reflecting excellent internal consistency (Hair et al., 2019).

Such multi-instrument evaluations are recommended for examining technology-enhanced learning interventions.

## 4. Research Instruments

Five primary instruments were employed in this study, each developed and validated according to the principles of classical test theory (Anastasi & Urbina, 1997). The needs assessment questionnaire consisted of three essential sections: demographic information, English proficiency, and learners' needs or obstacles.

It used a five-point Likert scale, with content validity confirmed through an expert IOC review, and demonstrated acceptable reliability (Cronbach's α = .80) (DeVellis, 2017).

The semi-structured interview protocols were developed based on relevant literature in EFL communication and teacher education and were reviewed by experts to ensure clarity, relevance, and alignment with the research objectives. Semi-structured interviews are widely used in educational research to capture in-depth perspectives while maintaining consistency across participants (Kvale & Brinkmann, 2009). The Microlearning-Gamification instructional materials, including storyboards, instructional videos, quizzes, and gamified reward systems, were also evaluated by experts using IOC procedures to verify content appropriateness and alignment with intended learning outcomes, following established practices in instructional design research (Branch, 2009).

The achievement test comprised 30 multiple-choice items aligned with course learning outcomes and English communication competencies. Content validity was confirmed through expert IOC review (IOC = .67-1.00), and test reliability was high (KR-20 = .87), indicating strong internal consistency for achievement measurement (Fraenkel et al., 2012). Finally, the attitude questionnaire, consisting of 20 Likert-scale items, was used to assess learners' perceptions of usability, engagement, and instructional effectiveness. The questionnaire demonstrated excellent reliability (Cronbach's α = .92), exceeding commonly accepted standards for attitudinal measures (Hair et al., 2019).

Collectively, these validation and reliability procedures provide empirical support for the quality of all research instruments and their suitability for addressing the study's research objectives.

Table 1 outlines the step-by-step procedures used to develop the research instruments. These procedures were designed to ensure that all instruments were theoretically grounded, content-valid, and statistically reliable prior to their implementation in the data collection phase.

**Table 1**

*Instrument Development Procedures*

| Step | Description |
|---|---|
| 1. Literature Review | Reviewed relevant studies on English as a Foreign Language (EFL) communication, teacher education, microlearning, and gamification to establish the conceptual framework for instrument development. |
| 2. Specification of Structure and Indicators | Analyzed variables, research objectives, and theoretical foundations to determine the structure, content domains, and indicators for all five instruments. |
| 3. Development of Draft Instruments (Draft 1) | Created initial versions of the instruments needs assessment questionnaire, semi-structured interview protocols, microlearning-gamification materials, achievement test, and attitudes questionnaire. |
| 4. Content Validity Review (IOC) | Three experts evaluated the congruence between items and objectives using the Index of Item-Objective Congruence (IOC) and provided suggestions for improvement. |
| 5. Revision Based on Expert Feedback | Revised wording, content, item structures, and media components to ensure clarity, appropriateness, and alignment with expert recommendations. |
| 6. Reliability Analysis | Calculated reliability coefficients Cronbach's alpha for questionnaires and KR-20 for the achievement test to ensure internal consistency and measurement accuracy. |
| 7. Finalization of Instruments | Compiled and refined the validated instruments for the actual data collection phase. |

**Data Collection**

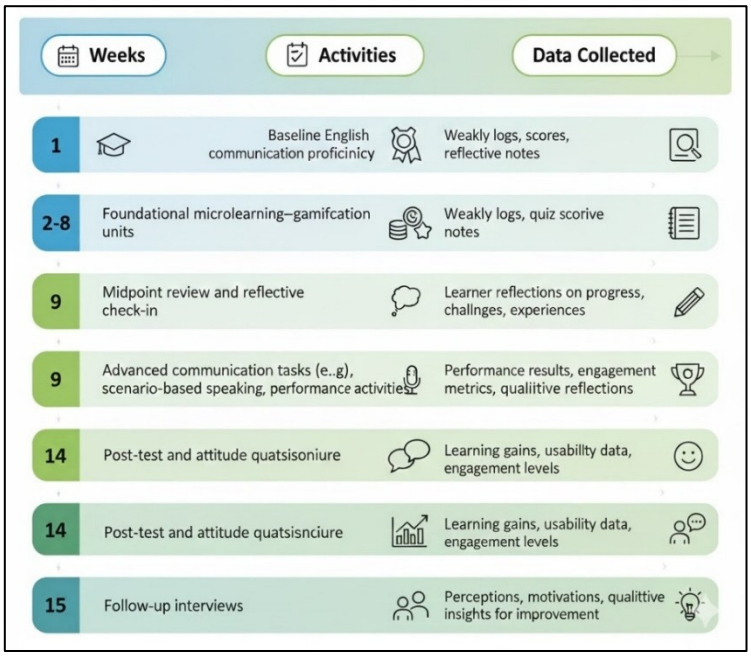
Prior to the 15-week intervention, two preparatory stages were conducted to ensure that the microlearning-gamification model was grounded in learner needs and pedagogically validated. First, a needs assessment questionnaire and semi-structured interviews were administered to identify student teachers' English communication challenges, learning expectations, and preferred instructional formats. Needs analysis is a well-established procedure in instructional and EFL research, providing an empirical basis for designing learner-centered interventions (Brown, 2016; Long, 2005). The findings indicated key needs related to speaking confidence, pronunciation development, and classroom communication skills, which directly informed the instructional design.

The second preparatory stage involved the development and validation of the instructional materials. Draft microlearning videos, interactive tasks, formative quizzes, and gamified components were reviewed by three experts using the Index of Item Objective Congruence (IOC), a commonly used method for content validation in educational research (Rovinelli & Hambleton, 1977). Materials with IOC values below .50 were revised to ensure conceptual accuracy, pedagogical relevance, and alignment with the intended learning outcomes.

Following these stages, data collection was embedded within a 15-week instructional implementation aligned with the mixed-methods and sequential design of the study. Weekly instructional activities incorporated formative assessments and systematic data collection to monitor learners' progress, engagement, and perceptions over time. Integrating data collection into the instructional process is recommended in technology-enhanced and design-oriented research, as it allows both learning outcomes and learner experiences to be examined concurrently (Creswell & Plano Clark, 2018; Reeves & Hedberg, 2014). This approach enabled a comprehensive evaluation of the effectiveness of the microlearning-gamification model through both quantitative and qualitative evidence. Accordingly, Figure 2 summarizes the overall instructional timeline and illustrates how data collection points were systematically embedded throughout the 15-week implementation of the microlearning-gamification model.

**Figure 2**

*15-Week Gamified Microlearning Intervention*




## Data Analysis

Data analysis was conducted in accordance with each research objective. For Research Question 1, which addressed learners' needs, questionnaire data were analyzed using descriptive statistics, including mean, standard deviations, and percentage, to summarize patterns in English proficiency and learning needs. Interview data were analyzed using thematic content analysis, following systematic coding procedures to identify recurring themes related to communication challenges and contextual factors (Braun & Clarke, 2006; Miles et al., 2014).

For Research Question 2, focusing on the development of the microlearning-gamification model, results from the needs analysis and expert evaluations were used to refine the model's structure and instructional components. Quantitative IOC values along with qualitative expert feedback, informed these revisions to ensure alignment between learning objectives, instructional activities, and assessment components, consistent with recommended practices in instructional design research (Branch, 2009; Rovinelli & Hambleton, 1977).

For Research Question 3, which examined the effectiveness of the instructional model, both quantitative and qualitative analyses were conducted. Pre- and post-test achievement scores were compared using the Wilcoxon Signed-Rank Test. This nonparametric procedure is appropriate for small samples and non-normally distributed data (Field, 2018; Pallant, 2020). Learner attitude questionnaire data were analyzed using descriptive statistics. Interview data were further examined through thematic analysis to capture participants' perceptions of usability, motivation, and support for English communication competencies.

To enhance the trustworthiness of the qualitative findings, methodological triangulation and expert validation were employed, following established criteria for credibility and dependability in qualitative research (Creswell & Poth, 2018; Lincoln & Guba, 1985). Together, these procedures ensured analytical rigor and consistency across all phases of the study.

## Findings

**RQ1: What are the needs of elementary education student teachers regarding a microlearning approach integrated with gamification?**

The needs analysis of ten elementary education student teachers indicated a clear pattern of high-priority requirements across all domains, with reported percentages representing the proportion of participants (out of 10) who rated each item at the highest level (Level 5). Overall, the participants emphasized the importance of content grounded in primary-level teaching practice, particularly English materials related to pronunciation, vocabulary instruction, and realistic classroom scenarios (60%). This practical focus extended to the preferred microlearning format, as dividing content into micro-units and incorporating interactive comprehension-check activities received the strongest support (60%), followed by learner-controlled sequencing and self-paced learning (50%). In terms of learning design, gamification was perceived as an effective means of sustaining engagement, especially through points and rewards (50%) and the inclusion of pre-lesson quizzes and enjoyable activities (40%). These design preferences aligned with reported skill development needs, which centered on strengthening speaking confidence, listening to native accents, classroom questioning, and reading from diverse sources (40%). Expected learning outcomes further reinforced this pattern, with most participants prioritizing the application of acquired knowledge in real teaching contexts (60%) and expressing support for a microlearning–gamification approach that promotes enjoyable and continuous language development (40%). Notably, no items were rated at low levels (Levels 1–2).

**RQ2: How can a microlearning–gamification model be developed to effectively support student teachers' English communication competencies for classroom-based communicative tasks?**

The development of the microlearning-gamification model followed an iterative process grounded in learner needs, expert input, and instructional design principles. Needs assessment data identified key areas of English communication for classroom-based tasks, including pronunciation, contextual vocabulary use, listening comprehension, classroom discourse patterns, role-play, and professional communication.

The model organized content into short 5-10-minute modules with clear objectives, targeted practice cycles, and review opportunities. These modules were aligned with communicative functions that elementary education student teachers must perform in real classrooms, such as giving instructions, asking questions, scaffolding responses, and managing student interaction. Gamification strategies, including points, badges, rewards, levels, and leaderboards were incorporated to enhance engagement, persistence, and motivation across learning cycles.

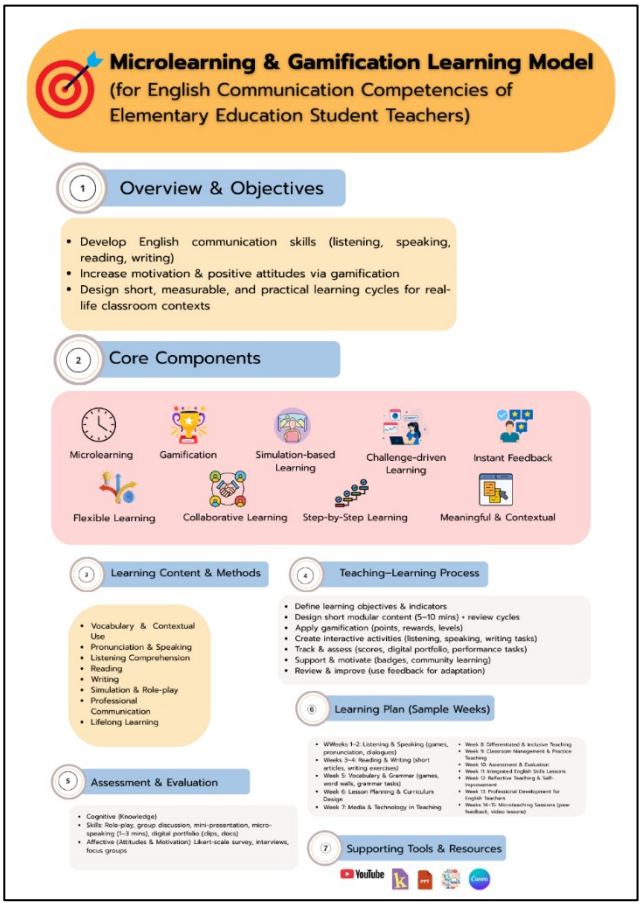
Simulation-based and challenge-driven activities were integrated to mirror authentic teaching scenarios, enabling learners to rehearse communicative tasks in controlled mini-lessons and practical situations. Core components of the model included microlearning modules, gamified tasks, collaborative activities, instant feedback mechanisms, and flexible learning pathways. Interactive exercises (e.g., listening tasks, speaking drills, contextual writing tasks, and mini-presentations) supported the development of communication competencies across listening, speaking, reading, and writing domains.

Expert validation using IOC confirmed the content validity of the model, with components below .50 revised to improve alignment with communicative teaching requirements. The finalized model incorporated step-by-step learning sequences, digital portfolios for monitoring progress, micro-speaking tasks (1-3 minutes), and performance-based assessments addressing cognitive, skill-based, and affective outcomes.

A structured 15-week learning plan operationalized the model into practice, progressing from foundational communication skills to integrated-skills lessons, classroom simulation tasks, reflective practice, and microteaching with peer feedback. This systematic progression ensured that the model effectively supported the development of student teachers' English communication competencies for classroom-based communicative tasks, as illustrated in Figure 3.

**Figure 3**

*Microlearning and Gamification Learning Model*

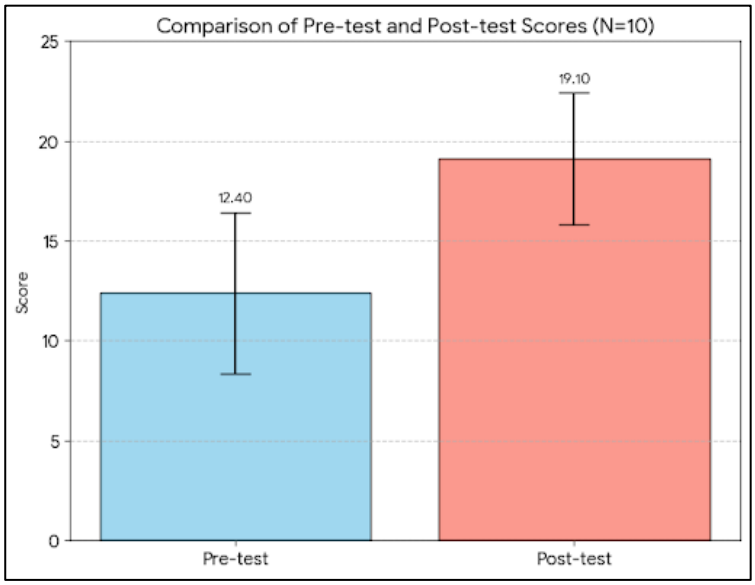


**RQ3: What are the effects of the implemented microlearning-gamification model on student teachers' attitudes, motivation, and English communication competencies?**

To evaluate the impact of the microlearning-gamification model on learning achievement, pre-test and post-test scores were compared. Figure 4 illustrates the changes in participants' English communication performance before and after the intervention.

**Figure 4**

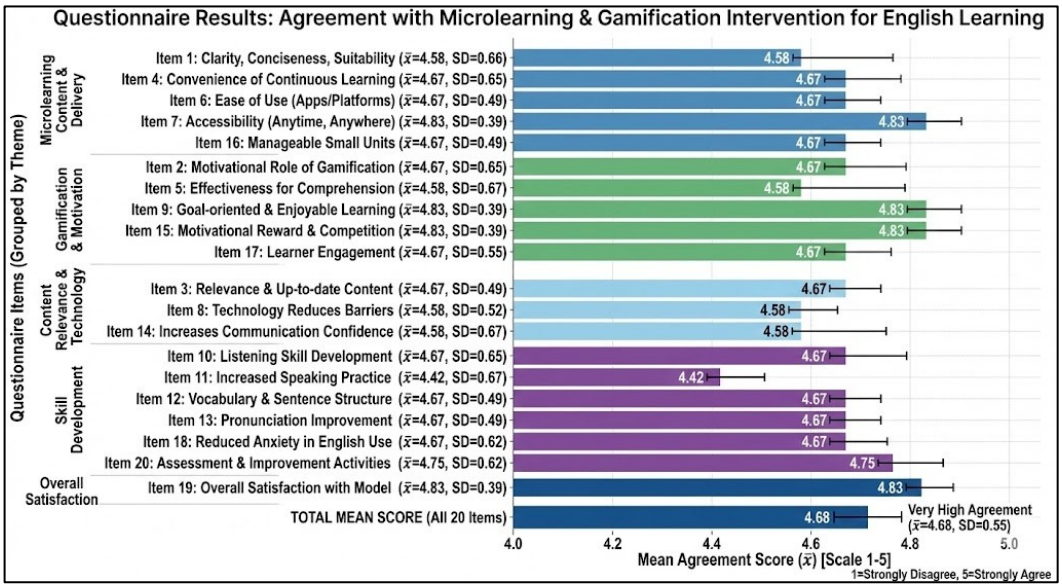
*Comparison of Pre-test and Post-test Scores*




The implementation of the validated model with ten elementary education student teachers yielded strong positive effects. Learning achievement improved significantly, with post-test scores ($\bar{x}$ = 19.10, SD = 3.31) substantially higher than pre-test scores ($\bar{x}$ = 12.40, SD = 4.03). The Wilcoxon Signed-Rank Test confirmed statistically a significant improvement ($p < .01$), with all participants showing positive gains and no negative ranks. Students demonstrated better grammatical accuracy, increased confidence, and improved responsiveness in simulated classroom communication tasks, especially in speaking and listening.

**Figure 5**

*Analysis of Student Attitudes, Opinions, and Motivation toward the Gamified Microlearning Model*




As shown in Figure 5, the figure shows very high levels of agreement with the microlearning and gamification intervention across all items, with mean scores ranging from 4.42 to 4.83. The highest ratings were given to learning accessibility, goal-oriented and enjoyable learning, motivational rewards, and overall satisfaction ($\bar{x}$ = 4.83). Content quality, ease of technology use, learner engagement, and skill development were also rated very highly. Overall, the total mean score ($\bar{x}$ = 4.68) indicates strong acceptance of the microlearning-gamification approach for English learning.

To complement the quantitative results, semi-structured interviews explored the students' experiences with the microlearning–gamification model, as summarized in Table 2.

**Table 2**

*Qualitative Findings from Semi-Structured Interviews*

| Theme | Key Description | Representative Quotes |
|---|---|---|
| Increased Confidence in English Communication | Microlearning activities reduced anxiety and supported gradual confidence building in speaking English. | *"The short speaking activities made me feel more confident because I could practice step by step."* (P3) |
| Improvement in Pronunciation and Speaking Practice | Focused micro-activities and repeated practice helped learners notice and correct pronunciation errors. | *"I could repeat the words many times until I felt confident."* (P1) |

| Theme | Key Description | Representative Quotes |
|---|---|---|
| Enhanced Motivation through Gamification | Game elements such as points and levels increased engagement and encouraged task completion. | *"It felt like a challenge, not an assignment."* (P4) |
| Usability and Learning Support | Short, flexible lessons supported self-paced learning and easy review. | *"I could study anytime, even when I didn't have much time."* (P2) |
| Relevance to Classroom Teaching Practice | Activities reflected real classroom communication tasks relevant to future teaching roles | *"It focused on real classroom situations, not just grammar."* (P10) |
| Positive Attitudes toward the Learning Model | Learners reported high satisfaction, enjoyment, and positive learning experiences. | *"I enjoyed learning this way and felt motivated throughout the course."* (P6) |
| Suggestions for Improvement | Learners suggested increasing the variety and enjoyment of activities to sustain motivation and speaking practice. | *"I would like more fun and varied activities, especially more speaking practice."* (P8) |
| Instructor Strengths | Teaching techniques and instructor personality contributed to a supportive learning environment | *"The teacher's techniques and personality made the class supportive and enjoyable."* (P9) |

Qualitative content analysis supported the patterns presented in Table 2. Overall, participants described the gamified microlearning model as enjoyable, motivating, and effective in supporting English communication. They valued the variety of activities and the supportive teaching approach, which helped create a positive and low-pressure learning environment. Participants also highlighted opportunities to apply communication skills in authentic or simulated teaching contexts, particularly for speaking and classroom interaction.

At the same time, learners suggested further increasing the variety of enjoyable activities and expanding speaking practice opportunities to sustain motivation over time. Taken together, these findings indicate that the model enhanced English communication competencies, foster sustained motivation, and provided a positive learning experience aligned with the needs and learning characteristics of pre-service teachers.

## Discussion

This study sets out to address a clear gap in the systematic design of technology-enhanced learning models for elementary education student teachers. Although prior work has emphasized the benefits of communicative, task-based, and motivational approaches in second-language learning (Nunan, 2004; Richards, 2006; Ryan & Deci, 2000), few studies have explored how these elements can be intentionally combined within a structured virtual microlearning model specifically tailored for elementary education student teachers. To respond to this gap, the present research pursued three objectives: (1) identifying student teachers' needs for English used in classroom communication, (2) developing a microlearning-gamification model aligned with those needs, and (3) examining its effects on their communication competencies and attitudes. The following discussion integrates these findings with the theoretical and empirical foundations reviewed earlier.

Building upon this overall aim, the results from the needs analysis revealed that student teachers placed high value on primary-level content, vocabulary and pronunciation practice, and realistic classroom scenarios. These preferences closely align with communicative language teaching principles that emphasize meaningful interaction (Richards, 2006). More importantly, they also correspond with previous studies showing that pre-service teachers consistently request materials rooted in real-world classroom discourse, particularly scenarios involving giving instructions and managing student interactions (e.g., Farrell, 2018; Lee, 2020). Students' interest in tasks such as giving directions and asking questions also reflects core concepts of Task-Based Language Teaching (Nunan, 2004), and parallels findings from Lai and Li (2011), who reported that task authenticity significantly predicts L2 learners' willingness to participate. The expressed need for confidence-building and exposure to native accents mirrors prior research emphasizing the importance of reducing affective barriers to facilitate comprehensible input (Krashen, 1987) and aligns with studies reporting that microlearning's brief, low-pressure format reduces anxiety (Alghamdi, 2022). Qualitative feedback further reinforced these patterns, highlighting the preference for flexible, self-paced modules, a trend widely observed in microlearning research (Buchem & Hamelmann, 2010). Collectively, these findings depict learner expectations that closely correspond to theoretical and empirical insights on functional language use, task manageability, and autonomy-supportive learning.

In response to these identified needs, the development of the microlearning-gamification model followed a systematic, needs-driven process aligned with recommendations from instructional design authorities (Van Merriënboer & Kirschner, 2018). When compared to prior microlearning-based interventions, the structure of 5-10-minute units is consistent with prior research demonstrating that brief instructional episodes enhance retention and reduce cognitive load (Hug, 2005; Mayer, 2009). Importantly, the present findings extend this line of research by showing that embedding communicative functions into micro-units improves not only knowledge recall but also practical classroom communication skills, an area that has received limited attention in earlier microlearning studies. Likewise, the inclusion of game mechanics (points, badges, and levels) aligns with studies showing that gamification supports learner persistence (Landers, 2014; Sailer et al., 2017). However, the present model contributes further evidence that such mechanics are particularly beneficial when embedded within authentic,

profession-oriented tasks. The integration of simulation-based tasks further strengthens the model, echoing findings that simulations enhance the transferability of teaching skills (Brown & Lee, 2015; Shank, 2016). Expert validation using IOC provided empirical support for content validity, and the structured 15-week progression reflects established scaffolding principles (Reiser & Tabak, 2014). Taken together, these features position the model both a skill-development tool and a practicum-oriented preparation framework bridging, theory and classroom application.

Furthermore, the effects of the model on learning achievement and learner attitudes provide additional evidence of its effectiveness. The statistically significant improvement in communication skills, reflected in higher post-test scores, aligns with studies indicating that microlearning combined with frequent low-stakes assessments enhances long-term retention (Cepeda et al., 2006; Roediger & Karpicke, 2006). While the inclusion of effect sizes measures (e.g., Cohen's d) would allow direct comparison with prior gamification and microlearning interventions, the consistent improvement across participants nonetheless suggests a robust learning impact. The motivational benefits observed parallel findings by Sailer and Homner (2020) and Hamari et al. (2014), who emphasize that well-aligned game mechanics enhance persistence and engagement. High satisfaction ratings regarding flexibility and reward clarity are also consistent with studies showing that mobile-supported microlearning enhances learner autonomy and goal orientation (Crompton & Burke, 2022). Qualitative reflections, including increased confidence and enjoyment, reinforce this positive trajectory, At the same time, comparative lower satisfaction with speaking-based gamification features reflects findings from L2 anxiety research indicating that communication apprehension may persist even in supportive learning environments (Krashen, 1987; MacIntyre, 1999).This suggests that gamified speaking tasks may benefit from additional scaffolding or anxiety-reducing strategies.

Overall, the findings show that the microlearning-gamification model effectively operationalized the theoretical frameworks underpinning in this study. Unlike previous research that examined microlearning or gamification in isolation, the integrated model enhanced both cognitive efficiency (Mayer, 2020) and learner motivation through autonomy, competence, and feedback (Ryan & Deci, 2000, 2020; Sailer et al., 2017). The inclusion of communicative and task-based activities ensured authentic practice, consistent with evidence that context-rich tasks support skill transfer (Nunan, 2004; Richards, 2006).

The convergence of quantitative gains and qualitative feedback suggests improvements in both performance and learner attitudes, echoing prior work in technology-enhanced teacher education (e.g., Seung, 2021). These results suggest that integrated microlearning-gamification models represent a practical and scalable approach for strengthening English communication competencies in teacher preparation programs. Visual summaries of learning gains and attitudes may further support instructional decision-making by clarifying the magnitude of change.

## Conclusion

This study developed and implemented a microlearning-gamification model based on short, goal-driven learning cycles integrating presentation, interaction, practice, and rapid formative checks across listening, speaking, reading, and writing. Needs analysis revealed priorities consistent with communicative and task-based pedagogy, including primary-level content, pronunciation and vocabulary practice, realistic classroom scenarios, and microlearning features such as content segmentation, interactive checks, clear goals, learner choice, and self-paced progression.

Evaluation results showed significant gains in English communication competencies, supported by improvements in pre-and post-test assessments and highly positive learner attitudes. Participants valued flexible access, clear and enjoyable learning goals, and the motivational effects of rewards and low-stakes competition. Speaking practice emerged as a comparatively weaker area, indicating the need for additional structured support to translate motivation into sustained oral participation.

Several limitations should be noted. The small sample size and relatively short intervention period limit generalizability and may not capture long-term effects. In addition, the model was implemented in a single institutional context, which may differ from other teacher education settings.

Despite these limitations, the findings suggest important pedagogical implications. Communicative, task-focused learning delivered through short microlearning cycles and supported by carefully designed gamification can enhance pre-service elementary teachers' English communication competencies. Teacher education programs may benefit from integrating microlearning modules, gamified feedback, and flexible learning pathways, with further emphasis on low-pressure speaking tasks, peer support, and personalized feedback. Future research should involve larger and more diverse samples, examine long-term classroom impacts, and explore adaptive or AI-supported features to refine the model, particularly for speaking development.

## Acknowledgment

The author declares that AI-assisted tools were used solely for language support and limited visual generation. Specifically, Grammarly was used for grammar and language editing, while Gemini and Ahrefs assisted with paraphrasing and word choice to improve clarity and readability. In addition, Gemini was used to generate some illustrative images. No AI tools were used to generate research ideas, analyze data, or interpret results. All analyses, interpretations, and conclusions are the sole work of the author. Data from previous studies are appropriately acknowledged, and all references are cited in accordance with academic standards.

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