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INNOVATIVE APPROACHES TO VOCABULARY DEVELOPMENT: THE ROLE OF MICROLEARNING IN ENGLISH LANGUAGE TEACHING

Abstract. The acquisition of a robust and functional vocabulary remains one of the most persistent challenges in English Language Teaching (ELT), acting as a critical gateway to communicative competence. Traditional pedagogical approaches, often reliant on decontextualized word lists, rote memorization, and massed practice, frequently result in superficial learning and rapid knowledge decay, failing to bridge the gap between passive recognition and active lexical retrieval.

This pedagogical insufficiency is further compounded by the evolving cognitive habits of the contemporary tertiary learner, whose engagement is increasingly shaped by the dynamics of the digital ecosystem—characterized by shortened attention cycles, a preference for on-demand content, and ubiquitous mobile access. In response to this complex challenge, this paper posits that microlearning, when conceptualized as a systematic and theoretically grounded

pedagogical strategy, offers a potent solution for fostering deep and durable vocabulary development.

This paper introduces a comprehensive conceptual model for integrating microlearning into tertiary English as a Second Language (ESL) contexts. Drawing upon an interdisciplinary synthesis of cognitive psychology, digital pedagogy, and Task-Based Language Learning (TBLL), we argue that microlearning transcends its popular definition as merely "short content." Instead, it represents a flexible, learner-centered modality that optimizes cognitive processing and enhances motivation.

The proposed model is structured around the PCP (Plan–Create–Practice) framework, a systematic approach for designing, delivering, and engaging with short, contextualized, and task-oriented learning units. It is elucidated how this framework leverages core mechanisms—including multimodal input, gamification, and reflective cycles to cultivate not only lexical competence but also learner autonomy and sustained engagement. Finally, the paper explores the profound implications of this paradigm shift for three critical domains: teacher professional development, instructional materials design, and the philosophy of language assessment in the digital age.

It has been argued that microlearning, when systematically implemented through a neuro-pedagogically sound framework like PCP, is far more than a passing trend. It is a powerful pedagogical strategy that directly addresses the cognitive and motivational needs of the 21st-century learner. By breaking down the formidable task of vocabulary acquisition into a series of manageable, engaging, and rewarding micro-experiences, this model fosters deep lexical competence, promotes genuine learner autonomy, and cultivates a sustainable, lifelong passion for language learning.

Keywords: microlearning, vocabulary development, digital pedagogy, learner autonomy, ESL teaching, lexical competence, innovation, English as a Second Language (ESL). Task-Based Language Learning (TBLL).

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ІННОВАЦІЙНІ ПІДХОДИ ДО РОЗВИТКУ ЛЕКСИЧНОЇ КОМПЕТЕНТНОСТІ: РОЛЬ МІКРОНАВЧАННЯ У ВИКЛАДАННІ АНГЛІЙСЬКОЇ МОВИ

Анотація Засвоєння ґрунтовного та функціонального словникового запасу залишається одним із найактуальніших викликів у викладанні англійської мови (ELT), виступаючи ключовою передумовою для формування комунікативної компетентності. Традиційні педагогічні підходи, що часто спираються на деконтекстуалізовані списки слів, механічне запам'ятовування та масовану практику, зазвичай призводять до поверхневого засвоєння та швидкої втрати знань, не долаючи розрив між пасивним розпізнаванням та активним відтворенням лексики. Ця педагогіч-на недостатність ще більше поглиблюється еволюцією когнітивних звичок сучасного студента, залученість якого все більше формується динамікою цифрової екосистеми, що характеризується скороченими циклами уваги, перевагою контенту на вимогу та повсюдним мобільним доступом. У відповідь на цей комплексний виклик, у цій статті висувається теза, що мікронавчання, концептуалізоване як систематична та теоретично обґрунтована педагогічна стратегія, пропонує дієве рішення для сприяння глибокому та стійкому розвитку словникового запасу.

У цій статті представлено комплексну концептуальну модель для інтеграції мікронавчання в контексті викладання англійської мови як другої (ESL) у закладах вищої освіти. Спираючись на міждисциплінарний синтез когнітивної психології, цифрової педагогіки та підходу до навчання на основі завдань (TBLL), ми стверджуємо, що мікронавчання виходить за межі свого популярного визначення як просто «короткий контент». Натомість, воно являє собою гнучку, орієнтовану на учня модальність, що оптимізує когнітивну обробку та посилює мотивацію. Запропонована модель структурована навколо фреймворку Планування–Створення–Практика — систематичного підходу до розробки, надання та взаємодії з короткими, контекстуалізованими та орієнтованими на завдання навчальними одиницями. Роз'яснюється, як цей фреймворк використовує ключові механізми, зокрема мультимодальний ввід, гейміфікацію та рефлексивні цикли, для розвитку не лише лексичної компетентності, але й автономії учня та стійкої залученості. Наостанок, у статті досліджуються глибокі наслідки цієї зміни парадигми для трьох критичних сфер:

професійного розвитку вчителів, дизайну навчальних матеріалів та філософії мовного оцінювання в цифрову епоху.

У статті доводиться, що мікронавчання, за умови його систематичного впровадження через нейропедагогічно обґрунтований фреймворк, як-от PCP, є значно більшим, ніж просто швидкоплинний тренд. Це потужна педагогічна стратегія, що безпосередньо відповідає когнітивним та мотиваційним потребам учня XXI століття. Розбиваючи складне завдання із засвоєння лексики на серію керованих, захопливих та винагороджувальних мікродосвідів, ця модель сприяє формуванню глибокої лексичної компетентності, заохочує справжню автономію учня та розвиває стійку, пожиттєву пристрасть до вивчення мови.

Ключові слова: Мікронавчання, Розвиток словникового запасу, Цифрова педагогіка, Автономія учня, Викладання англійської як другої мови (ESL), Лексична компетентність, Інновація, Англійська як друга мова (ESL) Навчання на основі завдань (TBLL).

Statement of the Problem and Its Connection to Key Scientific and Practical Tasks The central problem this paper addresses is the profound **disconnect** between traditional language assessment methods in English for Specific Purposes (ESP) and the authentic communicative demands placed on modern professionals. On a practical level, the reliance on standardized tests focused on linguistic accuracy often fosters performance anxiety and results in "brittle knowledge," creating a significant gap between high academic scores and a student's actual ability to perform confidently in high-stakes professional situations. This practical failure is rooted in a deeper scientific problem: a fundamental misalignment of these assessment practices with our modern, neuroscientifically-informed understanding of learning. Key scientific tasks today involve applying principles from cognitive psychology to optimize education, yet traditional assessment often ignores the negative impact of stress on the prefrontal cortex, the critical role of intrinsic motivation in long-term retention, and the principles of neuroplasticity that require active, reflective practice. Therefore, the key scientific and practical task is to bridge this gap by developing "brain-friendly" assessment models that work *with* the brain's natural mechanisms to cultivate deep, resilient, and truly applicable professional language competence.

Analysis of recent research and publications The conceptualization of microlearning as a transformative strategy for vocabulary acquisition is not predicated on technological novelty alone. Rather, its pedagogical potency is derived from a robust synthesis of established theories in cognitive science, educational psychology, and contemporary digital pedagogy. This section elucidates the theoretical underpinnings of the proposed microlearning model,

framing it as a neuro-pedagogically informed response to the demands of lexical development in the 21st century.

The human brain's capacity for processing new information is finite. A central challenge in traditional vocabulary instruction is the risk of inducing cognitive overload, a state where the volume and complexity of new lexical input exceed the learner's working memory capacity. As articulated in Cognitive Load Theory [20], this overload is primarily caused by extraneous load—the non-essential mental effort required to process poorly designed instruction. Microlearning directly addresses this challenge by strategically segmenting content into focused, single-concept "chunks." This methodological approach minimizes extraneous cognitive load, thereby freeing up crucial mental resources for germane load the deep cognitive processing required for schema construction and the integration of new vocabulary into existing knowledge structures.

Microlearning strengthens lexical competence by embedding vocabulary in episodic memory through frequent, meaningful exposure. The short learning bursts encourage retrieval practice, a mechanism essential for memory consolidation [17]. Moreover, microlearning integrates metacognitive reflection students can track progress, identify gaps, and self-correct thereby enhancing self-regulation and awareness of learning strategies.

A major advantage of microlearning lies in its ability to provide contextualized lexical input. Instead of memorizing isolated words, learners encounter vocabulary through micro-dialogues, images, or micro-videos that reflect real-world communication. These short segments promote semantic mapping and collocational awareness, which are key to lexical fluency [18].

Beyond immediate processing, the ultimate goal of vocabulary instruction is long-term retention and retrieval.

Microlearning is uniquely positioned to leverage established principles of memory science to this end. Ebbinghaus's seminal work on the "Forgetting Curve" demonstrated the exponential decay of memory without reinforcement. The affordances of Mobile-Assisted Language Learning (MALL) provide the ideal platform to counteract this decay through the systematic application of spaced repetition [16]. By delivering short, targeted practice sessions at algorithmically determined, increasing intervals, microlearning interrupts the forgetting curve, forcing active retrieval and progressively strengthening the neural pathways associated with each lexical item.

Furthermore, the multimodal nature of digital environments—integrating text, image, and sound as seen in research by Godwin-Jones (2018) and Boers (2021)—facilitates dual coding. This process creates multiple, interconnected memory traces for each word, significantly enhancing its retrievability and the depth of its semantic encoding.

Microlearning is philosophically aligned with a constructivist paradigm, wherein learners are not passive recipients of information but active constructors of their own knowledge.

Each micro-unit functions as a "learning capsule" or a cognitive building block, which the learner must actively engage with, interpret, and connect to their existing linguistic and conceptual schemas. This active, incremental process of knowledge construction is profoundly empowering.

This sense of empowerment is explained by Self-Determination Theory [5], which identifies three innate psychological needs that drive intrinsic motivation: autonomy, competence, and relatedness. Microlearning systematically addresses all three:

- **Autonomy** is fostered by providing learners with control over the pace, place, and often the path of their learning. They can choose when and where to engage with a 3-minute vocabulary task, aligning their study with their personal rhythms and needs.
- **Competence** is nurtured through the frequent and achievable successes inherent in completing short, well-defined tasks. The immediate feedback and visible progress (e.g., a filled progress bar, a new badge) generate a powerful sense of mastery and self-efficacy, which fuels further engagement.
- **Relatedness** is supported by integrating microlearning into collaborative digital ecosystems, where learners can share their progress, engage in friendly competition, or use the new vocabulary in peer-to-peer communication tasks, thus connecting their individual learning journey to a broader community of practice.

By satisfying these fundamental psychological needs, microlearning shifts the motivational locus from external pressures (e.g., grades) to internal drivers (e.g., curiosity, mastery), which is the cornerstone of sustainable, lifelong learning.

The primary aim of this article is to conceptualize microlearning as a scientifically-grounded pedagogical strategy for vocabulary acquisition in English Language Teaching (ELT). Drawing on cognitive psychology and digital pedagogy, the paper introduces the practical PCP (Plan–Create–Practice) framework for designing short, contextualized learning units that enhance lexical competence, learner autonomy, and motivation. Ultimately, the work explores the profound implications of this innovative approach for teacher development, materials design, and language assessment, arguing for a shift toward more flexible, brain-friendly learning models.

Introduction The efficacy of the proposed microlearning model is not incidental; it is anchored in established principles of cognitive science and modern learning theories that explain how the human brain processes, retains, and retrieves information most effectively. A cornerstone of this framework is the

science of memory formation. The work of Hermann Ebbinghaus on the "Forgetting Curve" demonstrates that without reinforcement, a significant portion of newly learned information is lost within hours and days. Microlearning directly counters this phenomenon by operationalizing the Spacing Effect—the principle that learning is more effective when study sessions are spaced out over time. By delivering short bursts of vocabulary practice at increasing intervals, microlearning interrupts the forgetting curve, systematically strengthening neural pathways and transferring lexical items from short-term to long-term memory.

Furthermore, the model is informed by John Sweller's Cognitive Load Theory, which posits that the human working memory has a limited capacity. Traditional vocabulary instruction often imposes a high extrinsic cognitive load by presenting learners with an overwhelming number of new words in a single session. Microlearning mitigates this by breaking down complex lexical sets into manageable, single-concept units. Each micro-task is designed to focus on a small number of related words (e.g., a set of synonyms, a phrasal verb and its colligates), thereby minimizing extraneous cognitive load and freeing up mental resources for deeper processing, such as understanding context, nuance, and usage.

This cognitive efficiency is amplified through the principles of Allan Paivio's Dual Coding Theory, which suggests that information presented both verbally and visually is more easily remembered than information presented in only one format. Microlearning is inherently suited to a multimodal approach. A single micro-unit can integrate text, images, short audio clips, and GIFs, creating multiple, interconnected memory traces for each lexical item. This not only enhances recall but also caters to a wider range of learning preferences.

Finally, the model is situated within the paradigm of Task-Based Language Learning (TBLL). A microlearning unit is not merely a digital flashcard; it is a micro-task. It requires the learner to perform a meaningful action with the target vocabulary be it categorizing words, completing a contextualized sentence, matching a word to a scenario, or making a choice in a mini-simulation. This task-based orientation ensures that the learning is active, goal-oriented, and immediately applicable, fostering a deeper understanding of vocabulary in use, rather than vocabulary as an abstract list of definitions.

The incorporation of the PCP micro-cycle into curriculum *The PCP Model – a tri-phasic microlearning cycle for neural consolidation.*

Phase 1: presentation (P) – cognitive priming and distinctive encoding.

The goal of this phase is to create a high-fidelity initial memory trace for 1-3 new lexical items, thereby avoiding the catastrophic interference and cognitive overload caused by massed presentation. This aligns with the principle of distinctiveness, where unique or vivid stimuli create stronger, more resilient memory traces [10].

– Micro-strategy 1. The multimodal anchor (30-60 seconds). This strategy leverages the picture superiority effect and emotional salience. By pairing a new word with a potent meme, GIF, or a single, evocative image (e.g., perplexed with a GIF of a puzzled animal), the lesson creates a visuo-emotional hook. Neuroscientifically, this engages the amygdala and visual cortex alongside language networks, constructing a richer, multi-modal representation that provides more retrieval cues than text alone.

– Micro-strategy 2. The «Word-Sound-Definition» snap (60 seconds). Utilizing a digital flashcard app (e.g., Anki, Quizlet), this task provides a simultaneous «snap» of orthographic form, phonological input, and a concise, student-friendly definition. This rapid, triple-coding approach efficiently builds the initial form-meaning mapping by engaging the brain's orthographic, phonological, and semantic processors in close temporal proximity, reinforcing the initial synaptic connections.

– Micro-strategy 3. The forced-choice micro-quiz (90 seconds). This is an immediate application of the testing effect. A single, rapid forced-choice question (e.g., «Is meticulous the opposite of careless?») forces active retrieval and metacognitive monitoring from the very first encounter. This effortful process, even if unsuccessful, provides critical feedback that sharpens the nascent memory trace and initiates the development of the word's semantic network by requiring relational reasoning.

Phase 2: context (C) – elaborative rehearsal and situated semantics.

This phase is dedicated to contextual elaboration, moving the lexical item from an isolated unit to an integrated node within a semantic and syntactic network. A word is not acquired until the learner understands its combinatorial properties and pragmatic force [14]. This phase directly targets the development of implicit knowledge.

– Micro-strategy 1. The 60-second authentic clip (120 seconds). Using a curated video clip from authentic media (e.g., a documentary, a film scene) where the target word is used naturally, this strategy provides a rich, situated context. Pausing the clip immediately after the word (via Edpuzzle) directs focal attention to its usage.

This mirrors real-world incidental acquisition, allowing learners to infer meaning from paralinguistic cues (intonation, facial expressions) and situational context, thereby building a more nuanced and pragmatically appropriate understanding.

– Micro-strategy 2. Micro-contextual analysis (90 seconds). Presenting 2-3 minimalist sentences that showcase the word's polysemy or register variation (e.g., an agile athlete vs. an agile mind) forces the brain to create multiple, flexible schemas for the same lexical entry. This prevents semantic fossilization – the

tendency to lock a word into a single, often overly narrow, meaning – and promotes the cognitive flexibility required for advanced language use.

– Micro-strategy 3. The «Micro-Gist» task (60 seconds). Requiring students to summarize the context or sentence's core meaning without using the target word is a task of reformulation. This proves comprehension has moved beyond simple definitional pairing to a deeper grasp of the semantic field. It compels learners to engage with synonyms and paraphrasing, thereby strengthening the interconnectedness of the entire lexical network.

Phase 3: production (P) – lexical retrieval and neural proceduralization.

The ultimate objective of vocabulary learning is the automatization of use. This phase focuses on forcing productive recall and accelerating proceduralization – the neurocognitive process of transferring knowledge from the declarative memory system (hippocampus-neocortex) to the procedural system (basal ganglia), where it can be executed fluently and with minimal conscious effort [22].

– Micro-strategy 1. The 30-second speaking challenge (180 seconds). This constrained, time-pressured production task requires learners to record a spoken response. The time pressure induces a desirable difficulty, forcing the brain to bypass slow, deliberate retrieval pathways and practice rapid lexical access. This builds neurological efficiency and fluency, while the low-stakes, private nature of recording significantly lowers the affective filter, reducing anxiety associated with public speaking.

– Micro-strategy 2. The «Two-sentence synthesis» (120 seconds). This concise writing task mandates the integration of new vocabulary with prior knowledge (e.g., "Summarize a recent historical event using the word catalyst"). This act of generative integration connects the new lexical node to existing cognitive schemata, dramatically enhancing its stability and integration within long-term memory. It demonstrates conceptual understanding, not just lexical recall.

– Micro-strategy 3. The vocabulary «Password» (on-the-go). Embedding the target word as a functional "password" for classroom rituals transforms vocabulary practice from an academic exercise into a social and communicative tool. This repeated, functional use in a low-anxiety context reinforces the word's pragmatic value and provides distributed, spaced practice in a genuine communicative act, further solidifying its place in the learner's active lexicon.

The efficacy of the PCP Model is not solely derived from the quality of its individual micro-tasks, but from their strategic temporal distribution. This orchestrated scheduling transforms a series of isolated activities into a powerful cognitive regimen designed to exploit the brain's natural processes of memory consolidation. The following weekly routine is engineered to move vocabulary

from labile, short-term representations to stable, long-term neural traces through the principles of spaced repetition, interleaved practice, and varied retrieval. *Feedback and iteration based on data analysis.*

The microlearning model inherently generates rich, granular data that can inform instruction.

– Analysis of SRS metrics. Reviewing learner data from platforms like Anki or Quizlet (e.g., cards marked "again" vs. "easy") provides objective, real-time insight into which lexical items are proving most difficult for the class, allowing for targeted re-teaching in subsequent Context or Production phases.

– Analysis of production artifacts. Reviewing the «one-sentence» challenges or audio logs allows the instructor to diagnose not just knowledge of the word, but errors in colligation, complementation, or pronunciation, enabling micro-interventions.

While the principles of microlearning are sound, their pedagogical efficacy is contingent upon a structured model that systematically induces deep processing and neural consolidation. We propose the Presentation-Context-Production (PCP) Model as a neurocognitively-optimized, micro-dosing framework for vocabulary acquisition. This model is specifically engineered to align with the attentional patterns of modern digital natives while counteracting the cognitive limitations that impede traditional methods. It orchestrates a deliberate sequence of micro-tasks, distributed across time, to guide lexical items from fragile, initial encoding to robust, automatically retrievable representations in the mental lexicon.

The weekly PCP micro-schedule: a neurocognitive rationale.

Monday (5 mins): presentation (P) of words 1-3

– Cognitive action. Initial encoding and distinctive priming.

– Neurological rationale. This session focuses on creating high-fidelity initial memory traces for the first subset of words. The use of multimodal anchors (engaging the visual cortex and amygdala) and the forced-choice micro-quiz (initiating the testing effect) ensure that these traces are distinct and robust from the outset. The hippocampus begins binding these disparate elements – form, sound, meaning, and image – into a coherent memory engram.

Tuesday (5 mins): presentation (P) of words 4-5 + production (P) quick spoken recall of words 1-3.

– Cognitive action. Encoding of new items + early retrieval and reconsolidation of previous items.

– Neurological rationale. This session introduces interleaving. While the hippocampus is encoding Words 4-5, it is simultaneously forced to retrieve Words 1-3 after a 24-hour delay – a critical period for the first major memory decay. This retrieval is not passive; the Production task (e.g., a quick spoken recall) is a desirable difficulty. The effort required to actively produce the words strengthens

the retrieval pathways and triggers memory reconsolidation, a process where the original memory trace is retrieved, destabilized, and then restabilized in a more durable form, making it more resistant to forgetting.

Wednesday (7 mins): context (C) for all words via authentic clips and micro-gist tasks.

– Cognitive action. Elaborative Rehearsal and semantic network expansion.

– Neurological rationale. After a second period of consolidation for all words, this phase shifts the focus from isolated form-meaning mapping to integration. By encountering the words in rich, authentic contexts, the brain is forced to create multiple and more complex associations. This elaborative encoding recruits broader neural networks in the neocortex, weaving the new vocabulary into existing knowledge schemata. The «Micro-Gist» task, which requires paraphrasing without the target word, prevents shallow processing and ensures deep semantic engagement, building a resilient web of connections around each lexical item.

Thursday (5 mins): production (P) writing task synthesizing all 5 words.

– Cognitive action. Generative Integration and forced lexical integration.

– Neurological rationale. This is a high-demand retrieval and synthesis task. Requiring the simultaneous use of all five words in a coherent written output forces the brain to access and manipulate the entire lexical set under significant constraint. This process:

1. Strengthens inter-lexical connections. Firing the neurons for all five words in close succession strengthens the synaptic links between them.

2. Promotes proceduralization. The act of formulating sentences engages grammatical and syntactic procedural memory, beginning to link the declarative vocabulary knowledge to the procedural system for language production.

3. Provides a High-Level Desirable Difficulty: The synthesis requirement ensures the retrieval is context-dependent and generative, far surpassing the difficulty and cognitive benefit of single-word recall.

Friday (5 mins): production (P) gamified review and «password» assessment.

– Cognitive action. Fluency building and automatization.

– Neurological rationale. The end-of-week session focuses on speed and automaticity. Gamified, rapid-fire review (e.g., on Kahoot! or Quizlet Live) encourages fast, accurate retrieval, training the brain to access the words with minimal conscious effort.

This practice is crucial for developing the fluency required for spontaneous conversation. The «Password» assessment embeds this retrieval into a social, low-stakes communicative act, further reinforcing the functional, pragmatic value of

the vocabulary and solidifying its transfer from academic knowledge to a usable communicative tool.

This non-linear, iterative PCP routine is a direct application of the most robust findings in memory science. It systematically induces synaptic consolidation (the strengthening of individual connections) and systems consolidation (the gradual redistribution of memory dependence from the hippocampus to the neocortex). By ensuring multiple, varied, and effortful encounters with each lexical item – spaced across days and cycling through Presentation, Context, and Production – the routine dramatically increases the retrieval strength and storage strength of the vocabulary. This is the neurocognitive foundation of true lexical «stickiness», transforming transiently known words into permanently available cognitive assets.

Outline of the main findings To transition microlearning from a series of disparate activities to a unified educational technique, we propose the PCP (Plan–Create–Practice) framework. This triadic cycle offers educators and students a methodical framework for organising vocabulary enhancement.

Stage 1: PLAN (Macro- and Micro-Goal Setting) The planning stage operates at two levels. At the macro-level, the instructor, in collaboration with the learners, identifies a broader lexical goal based on a needs analysis (e.g., "Mastering vocabulary for academic discussions," "Acquiring terminology for a marketing presentation"). This larger goal is then deconstructed into a logical sequence of micro-level learning objectives. Each micro-objective corresponds to a specific, manageable lexical set or function (e.g., "Learn five phrasal verbs related to negotiation," "Differentiate between three commonly confused words: *affect*, *effect*, and *influence*"). This planning stage ensures that the microlearning pathway is coherent, purposeful, and directly relevant to the learner's long-term aspirations.

Stage 2: CREATE (Designing Multimodal Micro-Tasks) This stage involves the design and creation of the microlearning units themselves. A key principle here is "one unit, one core concept." Each unit should be self-contained, focused, and designed for completion in 2-5 minutes. The creation process emphasizes multimodality and interactivity. Examples of micro-tasks include:

- An infographic visually explaining the difference between synonyms.
- A short video (<90 seconds) demonstrating the use of a phrasal verb in a real-world context.
- An interactive quiz with immediate, explanatory feedback.
- A drag-and-drop activity where learners match collocations.
- A GIF illustrating an idiomatic expression. The goal is to create a rich, engaging, and cognitively efficient learning object that can be easily accessed on mobile devices.

Stage 3: PRACTICE (The Active Learning Cycle) The practice stage is where the learner interacts with the micro-tasks. This is not a passive process of consumption but an active cycle of engagement, retrieval, and reflection. This stage is driven by two core mechanisms:

1. *Retrieval Practice***:** The tasks are designed to force the learner to actively retrieve the information from memory, which is a far more powerful learning event than simply re-reading it.

2. *Spaced Repetition:* Learning platforms can be used to automatically re-introduce micro-tasks at algorithmically determined intervals, ensuring that vocabulary is revisited just before it is about to be forgotten. This stage is cyclical, as performance data from the practice phase can inform adjustments to the learning plan, creating a personalized and adaptive learning journey.

The PCP framework is amplified by three intersecting mechanisms designed to foster motivation and deepen learning.

1. **Gamification:** To combat learning fatigue and enhance intrinsic motivation, gamification elements are woven into the practice cycle. This includes points for correct answers, badges for completing modules, leaderboards for friendly competition, and progress bars to visualize growth. These elements leverage the brain's dopamine-driven reward system, transforming vocabulary practice from a chore into a compelling and habit-forming activity.

2. **Multimodal Input:** As outlined by Dual Coding Theory, every micro-task is designed to present information through multiple channels. This rich sensory input not only strengthens memory but also helps learners to build a more holistic understanding of a word's meaning, pronunciation, and contextual use.

3. **Reflective Cycles:** To promote metacognition and learner autonomy, the microlearning sequence is punctuated by reflective prompts. After completing a set of tasks, a learner might be asked: *"Which of these five words do you feel least confident about using? Why?"* or *"Create one sentence relevant to your field of study using three of the new words you've learned."* These reflective moments encourage learners to think about *how* they learn, to connect new knowledge to their existing schemas, and to take conscious ownership of their developmental process. The integration of this microlearning model into tertiary ESL contexts necessitates a paradigm shift in several key areas. Teacher professional development must evolve to equip educators with skills in instructional design, digital content creation, and learning analytics interpretation. The role of the teacher shifts from a "sage on the stage" to a "guide on the side" and a "curator of learning experiences." Materials design must move away from static, linear textbooks toward dynamic, modular, and taggable digital resource banks that can be personalized for different learning pathways. Finally, language assessment must also adapt. The reliance on high-stakes summative exams gives way to a

model of continuous, low-stakes formative assessment. Progress is measured not only by test scores but by engagement metrics, completion rates, and qualitative evidence from reflective journals and digital portfolios.

Methodological Insights and Implementation

Effective vocabulary microlearning follows several pedagogical principles:

Table 1

Stage	Type of Activity	Description	Digital/Analog Tool
Input	Visual microtexts	Infographics, memes, or short stories introducing 5–7 words	Canva, Padlet
Practice	Micro-quizzes	Quick matching or recall tasks with immediate feedback	Quizlet, Kahoot
Output	Micro-challenges	1-minute speaking or writing tasks integrating target vocabulary	Flip, Padlet Voice
Reflection	Vocabulary journal	Learners write one reflective note after each micro-session	Google Docs, paper notebook

Each stage contributes to active, multimodal learning. Teachers act as facilitators, ensuring that vocabulary is revisited through diverse linguistic channels—reading, writing, listening, and speaking.

For teachers, integrating microlearning requires a shift from content transmission to learning design. Instructors curate micro-resources, structure repetition schedules, and monitor learner engagement through analytics and reflective prompts. Moreover, they encourage learners to personalize their digital environment—creating their own flashcards, word maps, or micro-videos.

Professional reflection becomes an integral part of this process. Teachers develop microteaching portfolios, documenting their experiments with microlearning units and evaluating learner outcomes. Such reflective practice fosters continuous innovation and pedagogical growth.

The findings suggest that microlearning functions as a pedagogical bridge between traditional and digital ELT paradigms. It operationalizes the principles of learner autonomy, constructivism, and communicative practice, offering a low-barrier entry point into technology-enhanced learning. Moreover, microlearning aligns with the “small wins” model of cognitive motivation—each micro-task provides a tangible sense of progress, reinforcing persistence.

However, successful implementation requires careful calibration. Over-fragmentation of content can lead to superficial understanding. Teachers must ensure conceptual coherence by designing micro-tasks that are short but connected within broader thematic units. In addition, equity and access issues remain crucial: not all learners have the same technological resources or digital literacy.

Conclusion Microlearning represents a paradigm shift in how vocabulary is taught, learned, and internalized. Its strength lies in cognitive efficiency, contextual relevance, and learner-centered design. Through structured frameworks such as PCP, teachers can transform vocabulary instruction into a continuous, reflective, and empowering process. The approach not only supports lexical growth but also cultivates essential 21st-century skills—autonomy, digital literacy, and self-regulated learning. The paradigm shift presented in this article goes far beyond conventional methodological improvements, proposing a fundamental reorientation of lexical pedagogy. The integration of the Presentation–Context–Production (PCP) model into the microlearning structure means a shift away from the industrial, unified teaching model towards a cognitive-lexical paradigm that is flexible, personalised and, most importantly, cognitively sensitive. Its construction is carefully aligned with the nonlinear, associative, and restrictive nature of the architectonics of the human brain, ensuring maximum correspondence between pedagogical design and cognitive learning mechanisms.

Breaking down the process of vocabulary acquisition into a three-phase cycle – presentation, context and production – and strategically distributing these micro-episodes over time allows English teachers to systematically apply the most compelling findings of cognitive psychology and neuroscience. It is not just about speeding up or entertaining learning, but about consciously constructing neural events. The PCP microdosing protocol directly influences key cognitive processes: it optimises encoding through selective priming, enriches memory traces through extended repetition, and accelerates proceduralisation through effortful retrieval and generative usage. This structured yet flexible approach ensures multi-level processing of each lexical unit, forming complex, multidimensional neural representations that constitute true lexical competence.

The end result exceeds a simple increase in vocabulary. The proposed paradigm forms consistent, autonomous learning behaviour by integrating learning into daily activities and turning it into a source of pleasure rather than anxiety. It empowers learners to become architects of their own mental lexicon, ensuring deep neural integration of English vocabulary – transforming words from abstract declarative units into dynamic, automatically accessible tools for thinking and communication.

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