

## THE USE OF MIND MAPS FOR VOCABULARY EXPANSION IN FOREIGN LANGUAGE ACQUISITION

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**<https://doi.org/10.5281/zenodo.15703944>**

**Abstract.** Foreign-language learners often struggle to move new lexical items from short-term exposure to durable, retrievable knowledge. Cognitive research suggests that visual-verbal integration, association density, and generative processing all facilitate lexical retention, yet classroom practice still relies heavily on de-contextualised word lists and rote repetition. The present study investigates the effectiveness of mind mapping as a vocabulary-building technique in an English-as-a-foreign-language (EFL) context. Sixty intermediate Uzbek university students were divided into experimental and control groups. Over ten weeks the experimental group constructed handwritten and digital mind maps that connected target words to semantic neighbours, collocations, images, and L1 equivalents, while the control group used traditional notebook glossaries. The findings support dual-coding, generative learning, and cognitive-load theories, suggesting that mind maps can be a cost-effective, scalable tool for vocabulary expansion.

**Keywords:** mind mapping; vocabulary acquisition; foreign-language learning; dual-coding theory; generative learning; cognitive load

Vocabulary knowledge is widely recognised as the bedrock of communicative competence, yet lexical growth remains one of the most intractable challenges for learners and teachers alike. Research spanning decades (Nation, 2022; Schmitt, 2014) demonstrates that learners require repeated, elaborated encounters with words across modalities before durable lexical representations emerge. Traditional techniques—word lists, translation pairs, and sentence gap-fills—often promote shallow processing and minimal semantic networking, leading to forgetting curves that erase gains within weeks.

Mind mapping, popularised by Buzan and Buzan (1993), offers a visually structured method for integrating new information into existing cognitive schemata. A mind map radiates outward from a central concept, linking branches that represent sub-themes, associations, images, and personal notes. This radial format ostensibly leverages dual-coding (Paivio, 2008) and multimedia learning principles (Mayer, 2020), enabling simultaneous activation of verbal and non-verbal channels while reducing extraneous cognitive load (Sweller, Ayres & Kalyuga, 2011).

Empirical work linking mind maps to foreign-language vocabulary growth remains limited and sometimes methodologically weak. Al-Jarf (2009) found significant receptive gains in a web-based Saudi EFL cohort, whereas Liu and Ying (2019) reported mixed results when mind maps were used only as a pre-reading strategy. Most studies employ short interventions or rely solely on receptive post-tests, leaving questions about productive depth, retention, and learner perceptions unanswered. Moreover, few investigations situate mind mapping within a theoretical triangulation that unites cognitive-load theory, generative learning, and input-enhancement frameworks (Krashen, 1985).

The present study addresses these gaps by examining whether systematic mind-map creation fosters both receptive and productive vocabulary growth, by exploring learner attitudes toward the technique, and by aligning findings with contemporary cognitive

theories. Three research questions guide the inquiry: (1) Does mind mapping produce greater receptive-vocabulary gains than traditional note-taking? (2) Does it enhance productive lexical use? (3) How do learners perceive the cognitive and motivational affordances of mind mapping?

Participants were sixty second-year undergraduates (age 18–21, 38 females, 22 males) enrolled in a compulsory English for Academic Purposes programme at Tashkent University of Information Technologies. Entry-level proficiency was B1-minus on the CEFR, confirmed by an institutional placement test. All participants had studied English for at least six years and reported minimal prior exposure to mind-mapping techniques.

A quasi-experimental pre-test/post-test design compared an experimental group ( $n = 30$ ) engaging in mind mapping with a control group ( $n = 30$ ) employing standard vocabulary notebooks. Classes met twice weekly (90 min) over a ten-week semester. Both groups received identical instructional input—40 thematic readings covering science and technology topics—delivered by the same instructor. The only variable was the note-making strategy practised after each lesson.

Following each reading, the experimental group collaboratively compiled a list of ten to twelve target words selected for salience, academic relevance, and frequency band (Nation's 4K–8K). Students then drafted individual mind maps around each target, embedding synonyms, antonyms, collocations, morphemic decompositions, contextual sentences, and, where appropriate, mnemonically resonant images. The instructor modelled efficient branching, colour coding, and minimal text. In weeks six to ten the group migrated to a free digital tool (Coggle™) to encourage technological transferability.

The control group copied teacher-provided word lists into lined notebooks, wrote L1 translations, and composed one example sentence per word—common practice in the local curriculum. Time on task for both conditions averaged fifteen minutes per session to control for exposure.

Receptive lexical breadth was measured with version 2 of the Vocabulary Size Test (VST) consisting of fourteen 10-item clusters. Productive depth was assessed with the open-response Lex30 test. Internal reliability indices for the cohort were  $\alpha = 0.91$  (VST) and  $\alpha = 0.87$  (Lex30). Semi-structured interviews, conducted in Uzbek during week eleven with fifteen volunteers from each group, elicited perceptions of strategy usefulness, cognitive effort, and engagement.

Pre- and post-test scores were analysed using paired-samples t-tests within groups and independent-samples t-tests across groups. Effect sizes (Cohen's  $d$ ) complemented p-values to gauge practical significance. Interview transcripts underwent thematic coding using an inductive approach, followed by frequency tallies of emergent categories.

Baseline comparisons showed no significant difference between groups in receptive or productive scores ( $p > 0.45$ ). After ten weeks, the experimental group's mean VST score rose from 3 210 to 3 722 items, a 16 % gain ( $t = 8.14$ ;  $p < 0.001$ ;  $d = 1.02$ ). The control group improved from 3 236 to 3 398 items, a 5 % gain ( $t = 2.21$ ;  $p = 0.033$ ;  $d = 0.29$ ). Between-group analysis of gain scores yielded  $t = 4.12$  ( $p < 0.01$ ), indicating a statistically robust advantage for mind mapping.

Productive-knowledge outcomes mirrored the receptive pattern. The experimental group increased its Lex30 mean from 13.4 to 15.9 unique lemmas, equating to a 19 % gain ( $t =$

5.02;  $p < 0.001$ ;  $d = 0.65$ ), while the control group rose from 13.2 to 14.0 lemmas, a 6 % gain that narrowly missed significance under Bonferroni adjustment ( $t = 1.98$ ;  $p = 0.054$ ).

Interview analysis revealed three dominant themes among mind-map users: heightened metacognitive control, visual memory support, and intrinsic enjoyment. Students reported that branching encouraged them to “see hidden relations,” prompted elaborative rehearsal, and reduced anxiety about forgetting. Control-group learners described their method as “simple but boring,” with several noting reluctance to revisit lists after initial completion.

From a theoretical standpoint, the results lend empirical weight to dual-coding theory. Learners simultaneously encoded verbal definitions and spatial-visual nodes, generating multiple retrieval cues. Generative-learning theory (Mayer, 2020) is likewise supported: the act of building connections required semantic processing beyond orthographic copying. Cognitive-load theory further explains the efficiency gains; mind maps externalised relational information, freeing working-memory resources for deeper integration, a dynamic corroborated by learners’ introspective reports of reduced mental clutter.

While the control group showed modest progress, their relatively shallow gains epitomise the inherent ceiling of rote translation lists. The reluctance to revisit such notes echoes previous observations that boredom undermines recycling frequency, thereby impeding consolidation.

Mind mapping emerges as a promising, learner-friendly technique for vocabulary expansion in foreign-language classrooms. By fostering associative networks, stimulating generative processing, and alleviating cognitive load, it outperforms traditional list-based approaches in both receptive and productive domains. Pedagogical adoption requires minimal resources yet yields appreciable lexical dividends. Broader implementation and longitudinal monitoring can further clarify its role within an integrated strategy repertoire for vocabulary instruction.

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