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FROM REAL-LIFE PHOTOS TO VOCABULARY LEARNING: AI-GENERATED INFOGRAPHICS IN VIETNAMESE HIGH SCHOOL EFL EDUCATION

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ABSTRACT

This study investigates the effectiveness of personalized AI-generated vocabulary infographics in improving vocabulary retention and learner engagement among Vietnamese upper-secondary EFL students. Drawing on Dual-Coding Theory and the Affective Filter Hypothesis, the study explored whether contextualized visual materials generated from students' real-life photographs could facilitate more meaningful vocabulary learning than traditional flashcard-based instruction. A mixed-methods quasi-experimental design was employed with 87 Grade 11 students at a public high school in Vietnam over a six-week intervention period. The experimental group learned vocabulary through multimodal AI-generated infographic posters created from familiar local contexts such as classrooms, cafés, and study spaces, while the control group used conventional vocabulary flashcards. Data were collected through vocabulary pre- and post-tests, learner satisfaction questionnaires, and semi-structured interviews. The findings indicated that students exposed to personalized infographic materials demonstrated significantly higher vocabulary retention and contextual usage. Qualitative data further revealed increased learner motivation, emotional connection, and reduced vocabulary learning anxiety. The study highlights the pedagogical potential of generative AI as a practical tool for developing localized, visually engaging, and emotionally meaningful vocabulary materials in Vietnamese EFL classrooms.

INTRODUCTION

Vocabulary learning is often constrained by decontextualized memorization, limited exposure time, and weak connections between new lexical items and learners' everyday experiences. Visual and contextualized materials can provide additional semantic and retrieval cues. Recent developments in generative AI make it possible for teachers to create personalized multimodal materials more efficiently. However, classroom-based evidence for AI-supported vocabulary learning, particularly among upper-secondary EFL learners, remains limited. This study therefore investigates AI-generated infographics as a teacher-supervised vocabulary-learning resource rather than treating AI as an autonomous tutor.

KEY FINDINGS

Provisional analysis indicates a larger pre-post vocabulary gain in the experimental group than in the control group.
Questionnaire responses indicate high perceived learning effectiveness, visual engagement, and motivational/personal relevance.
Provisional qualitative themes include:

(1) authentic photographs as retrieval cues;
(2) visual organization supporting comprehension;
(3) personal relevance increasing motivation and confidence;
(4) preference for continued use.

→ The emerging pattern supports the view that AI is most productive as a teacher-supervised material-generation tool embedded in established multimedia-learning principles.

SOME AI-GENERATED INFOGRAPHICS

Scan for more illustrations and materials

RESEARCH QUESTIONS

RQ1. To what extent does personalized AI-generated infographic instruction improve students' vocabulary achievement compared with conventional vocabulary instruction?

RQ2. What experiences and perceived mechanisms do students report regarding the use of real-life photographs and AI-generated vocabulary infographics?

QUESTIONNAIRE AND ACHIEVEMENT RESULTS

VOCABULARY ACHIEVEMENT RESULTS

Group	n	Pre-test	Post-test	Mean Gain
Experimental	45	56.82	82.47	+25.65
Control	42	57.19	71.64	+14.45

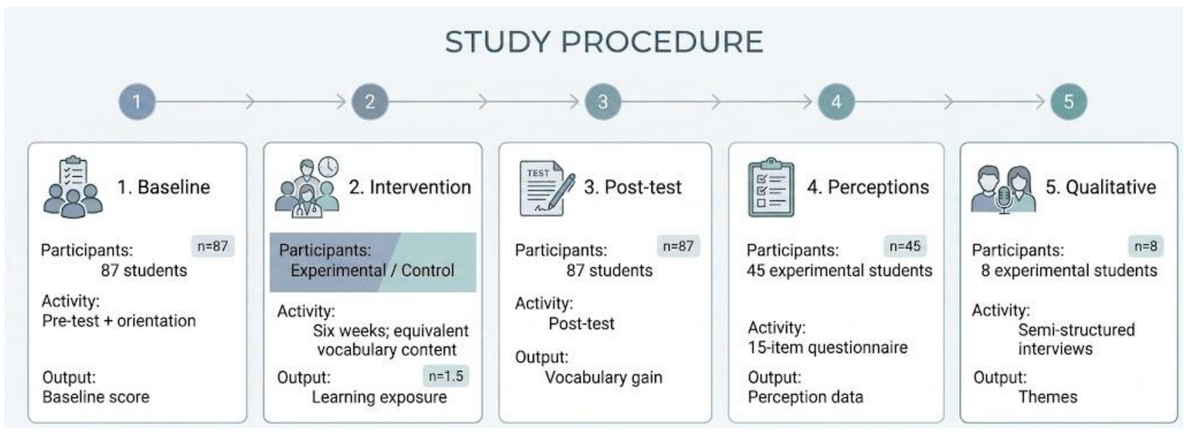
Experimental group showed a significantly higher gain in vocabulary achievement.

QUESTIONNAIRE PERCEPTION DATA

	Dimension	No. of Items	Mean
Perception	Perceived Learning Effectiveness	5	4.41/5
Visuals	Visual Engagement	5	4.66/5
Motivation	Learning Motivation & Personal Relevance	5	4.54/5
OVERALL	Overall	Σ 15	4.54/5

Feedback from the questionnaire indicates high levels of perceived effectiveness, engagement, and motivation for the program.

STUDY PROCEDURE



IMPLIMENTATIONS

Pedagogical: Use AI to create contextualized vocabulary materials from authentic, privacy-safe photographs while retaining human control over accuracy, level, examples, and visual density.

Curricular: Integrate personalized infographics with retrieval practice, contextualized vocabulary instruction, and communicative activities rather than using them as a stand-alone method.

Teacher development: Training should address prompt design, AI-output verification, visual instructional design, privacy/copyright, and responsible classroom integration.

Research: Future studies should use larger samples, delayed retention tests, stronger randomization, independent validation of AI-generated materials, and longitudinal designs.

HELPFUL PROMPT

"Keep the original image as the central visual element. Carefully analyze the image and select 12 English vocabulary items that are contextually appropriate to the setting, objects, actions, interactions, emotions, and overall situation depicted in the image.
For each vocabulary item, provide:

- English word or phrase IPA pronunciation
- Part of speech A simple, clear English definition
- 2–3 relevant verbs describing actions shown or implied in the image
- 2–3 natural example sentences demonstrating how the vocabulary can be applied in English speaking contexts

Use a formal, academic, and pedagogically appropriate tone. Ensure that the vocabulary is practical, context-specific, and suitable for English language learning.

Visual Design Requirements

- Preserve the original image as the main focal point.
- Create a modern, clean, minimalist, and highly legible educational poster.
- Use a light, elegant, and visually balanced layout.
- Avoid excessive decorative elements or visual clutter.
- Organize the vocabulary systematically so that all information can be read easily.
- Use clear typographic hierarchy, appropriate spacing, and consistent formatting.
- Design the poster in A4 portrait orientation."

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