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AI-Assisted Vocabulary Feedback and Learner Comprehension in EFL Classrooms

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Abstract: Recent advances in artificial intelligence (AI) have enabled rapid, individualized feedback and the automated generation of contextualized practice materials. These developments create new opportunities for enhancing vocabulary instruction in English as a Foreign Language (EFL) classrooms. This paper synthesizes recent research and technical discussions on AI-assisted vocabulary learning, with particular attention to comprehension, retention, and pedagogical implementation. Findings show that AI systems can increase practice frequency, generate contextual examples for spaced repetition, and provide immediate corrective feedback—benefits that are most effective when complemented by teacher guidance to safeguard accuracy and clarity. Practical recommendations for classroom use are also provided.

Keywords: AI tools, vocabulary comprehension, feedback, classroom practice, Automated Writing Evaluation (AWE), natural learning processes

Vocabulary knowledge is fundamental to reading comprehension, listening fluency, and effective language use. Traditional instructional methods—such as word lists, teacher explanation, and occasional practice—often fail to provide the varied, contextualized exposure required for long-term retention (Zarrati, 2024). AI-powered tools, including Automated Writing Evaluation (AWE) systems, generative models, and adaptive spaced-repetition engines, can support learners by providing examples, identifying errors, and tailoring review schedules to individual needs. However, their effectiveness depends greatly on classroom implementation and students' ability to interpret and act on feedback (Aldosemani, 2023; Wei, 2023).

This study examines how AI technologies can support vocabulary acquisition and retention through personalized learning, adaptive feedback, and interactive environments. The integration of AI into language learning systems may also strengthen memory strategies and ultimately

improve overall proficiency. Current research suggests three main mechanisms through which AI may enhance vocabulary development:

1. **Immediate corrective feedback.**

   AI writing tools and AWE systems provide real-time feedback on word choice, collocation, and form. This encourages learners to revise their work more thoughtfully and more frequently than in traditional settings. Meta-analyses of automated feedback in second-language writing support these effects (Fan & Ma, 2022; Wei, 2023).

2. **Rich and meaningful exposure.**

   Modern natural language processing (NLP) systems can generate numerous example sentences using target vocabulary. Such increased exposure helps learners infer meaning and observe usage patterns, strengthening spaced-repetition practices. Recent studies demonstrate that spaced repetition software can be enhanced with automated sentence generation.

3. **Personalized scheduling and adaptive practice.**

   AI-driven spaced-repetition systems prioritize vocabulary items based on learner performance, helping students review material at optimal intervals. Research indicates that digital flashcards and adaptive scheduling improve retention compared with non-adaptive practice (Paddags & Hershcovich, 2024).

To maximize comprehension gains while minimizing risks—such as inaccurate feedback or overdependence on automation—teachers should consider the following:

- **Combine AI micro-feedback with teacher macro-feedback.**

   Use AI for routine reminders about spelling, collocation, and basic usage, while reserving teacher input for deeper issues such as meaning, register, and task appropriateness.

- **Require active checks of understanding.**

   Pair AI-generated corrections with tasks requiring active processing, such as paraphrasing, sentence creation, or explaining word choices in L1/L2. This reduces the risk of passive acceptance of AI suggestions.

- **Integrate AI-generated sentences into spaced repetition cycles.**
  Add automatically generated example sentences to digital flashcard decks to enhance variety and contextualization. Emerging NLP research suggests that combining automated sentence synthesis with SRS algorithms is effective.

- **Monitor bias and accuracy.**
  Check AI-generated suggestions for correctness, and train teachers to recognize common AI errors, including unnatural collocations or subtle semantic issues.

Limitations and Research Gaps

Although the literature on AI-assisted vocabulary learning is expanding, it remains inconsistent. Most studies focus on writing or short-term interventions, while long-term retention and transfer to comprehension tasks require more robust longitudinal research. Moreover, the quality of AI output varies by model and design, limiting the generalizability of findings across different tools.

Conclusion

AI-assisted vocabulary feedback presents a transformative opportunity for improving vocabulary comprehension and retention in EFL contexts. Tools such as AWE systems can deliver rapid corrective feedback, generate contextualized examples, and personalize practice through adaptive spaced repetition. When paired with teacher mediation, these technologies can significantly deepen learners' engagement with vocabulary. However, successful implementation requires careful attention to potential inaccuracies, model biases, and the need for ongoing teacher oversight. Future research should prioritize longitudinal studies evaluating the sustained impact of AI-assisted vocabulary learning. With informed and strategic integration, AI can meaningfully enhance vocabulary development in EFL classrooms while promoting critical thinking and learner autonomy.

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