


# TEACHER-CENTERED DIGITAL PEDAGOGY FOR INFORMAL AI-MEDIATED EFL VOCABULARY INSTRUCTION: A CONCEPTUAL FRAMEWORK

Dwi Sloria Suharti<sup>1</sup>; Dayu Retno Puspita<sup>2</sup>

<sup>1</sup> Department of English Language Education, Universitas Muhammadiyah Tangerang, Indonesia

<sup>2</sup> Department of Primary School Teacher Education, Universitas Muhammadiyah Tangerang, Indonesia

 [dwisloria@umt.ac.id](mailto:dwisloria@umt.ac.id); [dsloria@gmail.com](mailto:dsloria@gmail.com)

## *Abstract*

*The rapid development of artificial intelligence (AI) is reshaping how English as a Foreign Language (EFL) teachers support vocabulary learning beyond formal classroom instruction. Existing studies have mostly examined learners' autonomous use of AI tools, while the teacher's role in mediating AI through everyday instructional planning remains under-theorized. This conceptual paper proposes a teacher-centered framework that explains how informal AI-mediated planning can enhance EFL vocabulary instruction. Synthesizing vocabulary acquisition theory, teacher cognition, learner engagement, and digital pedagogy, the framework links teacher decision-making to informal AI-supported planning, pedagogical mediation, learner engagement, and vocabulary development. The framework positions AI as a planning resource whose instructional value depends on teachers' professional judgment rather than as an independent instructional agent. The model provides a foundation for future empirical research and practical guidance for pedagogically grounded AI integration in vocabulary instruction.*

**Keywords:** *AI-mediated instruction; EFL vocabulary learning; Informal AI use; Instructional planning; Teacher-centered pedagogy*

## PEDAGOGI DIGITAL BERPUSAT PADA GURU UNTUK PENGAJARAN KOSAKATA EFL BERBASIS PENGUNAAN AI INFORMAL: KERANGKA KONSEPTUAL

### **Abstrak**

Perkembangan pesat kecerdasan buatan (AI) mulai mengubah cara guru English as a Foreign Language (EFL) mendukung pembelajaran kosakata di luar pembelajaran formal di kelas. Studi yang ada umumnya menyoroti penggunaan AI secara mandiri oleh siswa, sementara peran guru dalam memediasi AI melalui perencanaan pembelajaran sehari-hari masih kurang terkonseptualisasikan. Artikel konseptual ini mengusulkan kerangka berpusat pada guru untuk menjelaskan bagaimana perencanaan pembelajaran berbantuan AI secara informal dapat memperkuat instruksi kosakata EFL. Dengan mensintesis teori pemerolehan kosakata, kognisi guru, keterlibatan belajar, dan pedagogi digital, kerangka ini menghubungkan pengambilan keputusan guru dengan praktik perencanaan berbantuan AI, mediasi pedagogis, keterlibatan siswa, dan perkembangan kosakata. AI diposisikan sebagai sumber daya perencanaan yang nilai instruksionalnya bergantung pada pertimbangan profesional guru, bukan sebagai agen pengajaran yang berdiri sendiri. Kerangka ini menyediakan landasan bagi riset empiris berikutnya

sekaligus arahan praktis bagi guru untuk mengintegrasikan AI secara peka konteks dan berlandaskan pedagogi.

**Kata kunci:** Pembelajaran yang dimediasi AI; Pembelajaran kosakata EFL; Penggunaan AI informal; Perencanaan pembelajaran; Pedagogi berpusat pada guru

## 1. Introduction

Vocabulary knowledge plays a central role in English as a Foreign Language (EFL) learning because it underpins learners' ability to comprehend texts, express meaning, and participate in communicative activities [1], [2]. Despite its importance, vocabulary instruction in many EFL contexts continues to face persistent challenges, including limited instructional time, diverse learner proficiency levels, and restricted exposure to English beyond the classroom. These constraints require teachers to design instructional practices that extend learning opportunities while remaining sensitive to contextual realities.

Recent developments in digital technology, particularly artificial intelligence (AI), have introduced new possibilities for supporting language learning. Generative AI tools such as ChatGPT can assist teachers in producing example sentences, thematic word lists, contextualized tasks, and practice materials. At the same time, research on Informal Digital Learning of English (IDLE) highlights how digital environments enable language exposure beyond formal instruction, often through learner-initiated activities [3], [4]. More recently, the notion of AI-mediated IDLE has been introduced to describe informal language learning activities supported by AI technologies [5].

However, existing research on IDLE and AI-mediated language learning has largely focused on learners' autonomous engagement with digital tools. While this body of work provides valuable insights into learner motivation, exposure, and personalization, it pays comparatively little attention to the instructional processes that shape how AI is pedagogically integrated. In particular, the role of teachers in mediating AI use through instructional planning and professional judgment has received limited conceptual attention. This omission may lead to interpretations that position AI as a self-directing instructional agent rather than as a pedagogical resource whose educational value depends on instructional design.

## 2. Literature Review

### 2.1. Informal Digital Language Learning

In everyday teaching practice, many EFL teachers already engage with AI informally. Without formal institutional policies or structured training, teachers experiment with AI tools to support instructional planning, adapt instructional materials, and respond to immediate classroom needs. These practices are typically teacher-initiated, flexible, and context-driven. Such informal AI use reflects an emerging form of teacher agency within digital pedagogy, where educators actively negotiate how technology aligns with their instructional goals. Despite its growing prevalence, this form of pedagogical practice has received limited theoretical attention in EFL research, particularly in relation to vocabulary instruction.

Conceptualizing AI integration as AI-mediated instruction offers a useful lens for addressing this gap. Rather than framing AI as a replacement for teaching, an AI-mediated perspective emphasizes teachers' roles as pedagogical mediators who evaluate, adapt, and contextualize AI-generated resources. This perspective aligns with digital pedagogy and teacher knowledge frameworks, such as Technological Pedagogical Content Knowledge (TPACK), which stress the integration of technology with pedagogical reasoning and content

expertise [6], [7]. From this viewpoint, instructional planning becomes the central mechanism through which AI supports learning.

## 2.2. Vocabulary Learning Beyond the Classroom

Vocabulary acquisition theory further reinforces the importance of this mediation. Effective vocabulary learning requires repeated exposure, meaningful use, and contextualized practice [1], [2]. While AI tools may assist in generating materials that support these conditions, such materials only become instructionally effective when guided by pedagogical intent and professional judgment. Consequently, the effectiveness of AI in vocabulary instruction depends less on technological sophistication and more on how teachers incorporate AI into instructional planning.

Accordingly, this conceptual paper proposes a teacher-centered framework for informal AI-mediated EFL vocabulary instruction. The framework positions instructional planning as the core mediating process linking teacher decision-making, informal AI use, learner engagement, and vocabulary development. By foregrounding teacher-centered digital pedagogy, the framework challenges technology-driven models of AI integration and highlights the importance of context-sensitive and pedagogically grounded instructional design. The proposed framework aims to provide a theoretical foundation for future empirical research and conceptual guidance for EFL teachers seeking to integrate AI into vocabulary instruction in sustainable and meaningful ways.

## 3. Methodology

This study adopts a conceptual research design based on theory synthesis to develop a framework explaining how informal AI-mediated instructional planning supports EFL vocabulary instruction. Rather than generating empirical data, the study aims to integrate and reinterpret existing theoretical insights to address an under-theorized pedagogical phenomenon, namely, teachers' informal mediation of AI within vocabulary-focused instructional planning. This approach is appropriate for advancing conceptual understanding in areas where educational practices evolve more rapidly than empirical research can capture [8], [9].

### 3.1. Conceptual Research Orientation

Conceptual research seeks to extend theory by identifying new relationships among existing constructs, clarifying underexplored processes, and offering integrative perspectives [8]. In the context of AI use in EFL education, much of the existing literature emphasizes technological affordances or learner-driven engagement. However, the pedagogical processes through which teachers interpret, adapt, and mediate AI-generated resources remain insufficiently conceptualized. A theory synthesis approach allows these processes to be examined holistically by connecting insights from multiple bodies of scholarship.

Following an interpretive and iterative approach to conceptualization [9], the framework was developed through critical reading, comparison, and integration of theories related to vocabulary learning, digital pedagogy, learner engagement, and teacher knowledge. The objective was not to summarize existing models, but to reorganize theoretical insights in a way that foregrounds instructional planning as the central mediating mechanism in AI-mediated EFL vocabulary instruction.

### 3.2 Literature Domains Informing the Synthesis

The proposed framework draws on four interrelated domains of literature, each contributing a specific theoretical function.

First, research on EFL vocabulary acquisition emphasizes that vocabulary learning requires repeated exposure, meaningful engagement, and contextualized use of lexical items [1], [2]. These principles provide criteria for evaluating how AI-generated materials may support vocabulary development when incorporated into instruction.

Second, literature on AI and digital tools in language education highlights the potential of generative AI to support material development, task variation, and personalization [5]. However, this body of research often assumes direct learner–AI interaction. In this study, AI is conceptualized as a planning resource whose instructional value depends on teacher mediation.

Third, studies on learner engagement conceptualize engagement as a multidimensional construct involving cognitive, behavioral, and affective participation in learning activities [10]. This perspective informs the framework’s assumption that engagement emerges from pedagogically designed tasks rather than from technology use alone.

Fourth, research on teacher knowledge and digital pedagogy, particularly the Technological Pedagogical Content Knowledge (TPACK) framework, emphasizes the integration of technology with pedagogical reasoning and content expertise [6], [7]. This perspective underpins the teacher-centered orientation of the proposed framework and positions teachers as active designers who mediate AI use through professional judgment. Thus, these domains provide a coherent theoretical foundation for conceptualizing AI-mediated instruction as a pedagogical, rather than technological, phenomenon.

### 3.3 Clarification of Key Constructs

To ensure conceptual precision, the framework defines and delimits its core constructs as follows.

- a. Instructional Planning refers to teachers’ reflective processes of designing, adapting, and sequencing learning tasks, including the evaluation and modification of AI-generated materials.
- b. Informal AI-Mediated Use denotes teachers’ voluntary and self-directed engagement with AI tools outside formal institutional mandates or structured training programs.
- c. Teacher Decision-Making involves pedagogical judgments related to content selection, task appropriateness, and learner needs.
- d. Learner Engagement encompasses learners’ cognitive investment, behavioral participation, and affective response to instructional activities.
- e. Vocabulary Development includes both vocabulary breadth and depth, reflecting learners’ ability to recognize, understand, and use lexical items appropriately.

These definitions were formulated to maintain internal coherence and to avoid conflating AI use with learning outcomes.

### 3.4 Framework Development Process

The framework was developed through a systematic synthesis process consisting of four stages. First, theoretical tensions between technology-centered models of AI integration and pedagogically grounded accounts of teaching practice were identified through a literature review. Second, conceptual relationships among teacher decision-making, instructional planning, AI mediation, learner engagement, and vocabulary development were mapped and organized. Third, instructional planning was positioned as the central mediating mechanism linking informal AI use with learning outcomes, emphasizing teacher agency and pedagogical intent. Finally, the framework underwent iterative refinement to ensure conceptual clarity, logical coherence, and alignment with established theories in EFL pedagogy and digital education.

This process resulted in a conceptual model with a dynamic and cyclical structure that reflects the reciprocal nature of teaching, planning, and learning.

### 3.5 Scope and Theoretical Contribution

As a conceptual framework, the proposed model does not claim empirical generalizability. Instead, it offers a theoretically grounded lens for understanding how teachers mediate the use of AI through instructional planning in EFL vocabulary instruction. The framework is intended to be adaptable across diverse educational contexts, particularly where formal AI training or institutional guidance is limited.

Hence, the framework contributes to digital pedagogy by emphasizing sustainability, contextual sensitivity, and professional agency. It also provides a foundation for future empirical research examining how AI-mediated instructional planning influences learner engagement and vocabulary development over time.

## 4. Results and Discussion

This conceptual study proposes a teacher-centered framework for informal AI-mediated EFL vocabulary instruction. The framework explains how teachers' instructional planning mediates the relationship between informal AI use and learners' vocabulary development. Four interrelated components are identified: (1) teacher decision-making, (2) informal AI-mediated instructional planning, (3) learner engagement, and (4) vocabulary development. These components do not represent linear stages but form an interconnected and cyclical pedagogical process, with instructional planning positioned as the central mediating mechanism.

### 4.1 Teacher Decision-Making as the Pedagogical Foundation

Teacher decision-making constitutes the foundational element of the proposed framework. In AI-mediated instructional contexts, teachers draw on professional knowledge to determine instructional goals, select vocabulary content, and evaluate the pedagogical suitability of AI-generated materials. This process reflects a teacher-centered orientation to digital pedagogy, in which instructional choices are guided primarily by contextual and pedagogical considerations rather than by technological affordances alone.

Informed by the Technological Pedagogical Content Knowledge (TPACK) framework, teacher decision-making involves balancing content knowledge of vocabulary, pedagogical strategies, and technological possibilities [6], [7]. AI-generated outputs are not adopted automatically. Instead, teachers critically assess their linguistic accuracy, level appropriateness, and relevance to learner needs. Through this evaluative process, teachers function as pedagogical mediators who determine how and whether AI contributes meaningfully to instruction. This positioning reinforces teacher agency and emphasizes that AI integration remains subordinate to instructional intent.

### 4.2 Informal AI-Mediated Instructional Planning

The second component of the framework focuses on informal AI-mediated instructional planning, defined as teachers' voluntary and self-directed use of AI tools to support planning processes outside formal institutional requirements or structured professional development programs. Such practices are typically flexible, exploratory, and closely aligned with immediate instructional needs, reflecting how teachers adapt digital tools to local teaching contexts [8], [9].

Examples of informal AI-mediated planning include generating contextualized vocabulary examples, designing practice tasks, adapting reading passages, and developing prompts for communicative activities. Research on generative AI in language education indicates that tools such as ChatGPT can support material development and task variation during the planning stage [5]. Within the proposed framework, however, AI does not function

as an instructional agent. Rather, it is conceptualized as a supportive planning resource whose outputs are evaluated, modified, and sequenced by teachers based on pedagogical goals and learner profiles.

From a vocabulary acquisition perspective, such mediation is essential. Effective vocabulary learning requires meaningful exposure, repetition, and contextualized use rather than isolated presentation [1], [2]. AI-generated materials therefore gain pedagogical value only when integrated into coherent instructional plans that reflect established principles of vocabulary teaching. This emphasis aligns AI integration with pedagogical design rather than technological automation.

Importantly, informal AI-mediated instructional planning often emerges from everyday teaching practice rather than from top-down policy initiatives. Teachers' exploratory engagement with AI reflects professional agency and adaptive expertise, particularly in contexts where formal guidance on AI use is limited [5]. By foregrounding these practices, the framework demonstrates that innovation in digital pedagogy can be driven by reflective instructional planning rather than by technological determinism.

### **4.3 Learner Engagement as a Mediated Outcome**

Learner engagement is conceptualized in the framework as an indirect and mediated outcome of AI-informed instructional planning. Engagement is understood as a multidimensional construct encompassing cognitive investment, behavioral participation, and affective involvement in learning activities [10]. Importantly, learners are not assumed to interact directly with AI tools. Instead, they engage with instructional tasks and materials that have been shaped through teacher–AI mediation.

When teachers design vocabulary activities that are contextually relevant, level-appropriate, and meaning-focused, learners are more likely to participate actively in learning processes. The framework emphasizes that engagement does not arise from the mere presence of technology, but from pedagogically coherent task design. AI contributes to learner engagement only insofar as it supports teachers in creating varied, meaningful, and accessible instructional experiences through thoughtful planning.

This mediated view of engagement challenges assumptions that digital tools inherently motivate learners. Instead, it underscores the role of instructional planning in shaping how learners experience and respond to AI-supported materials.

### **4.4 Vocabulary Development as a Cumulative Result**

Vocabulary development represents the primary learning outcome within the proposed framework. Drawing on established theories of vocabulary acquisition, the framework recognizes both vocabulary breadth, referring to the number of words known, and vocabulary depth, referring to knowledge of form, meaning, and use [1], [2].

AI-mediated instructional planning enables teachers to provide learners with repeated and varied exposure to lexical items across different contexts. For instance, AI-generated dialogues, contextualized example sentences, or thematic texts may support retention when incorporated systematically into instructional sequences. However, the framework deliberately avoids attributing vocabulary gains directly to AI use. Vocabulary development is instead understood as a cumulative result of teacher-mediated instructional pathways that align AI affordances with pedagogical principles.

This position reinforces the idea that AI serves as a facilitative tool rather than a determinant of learning outcomes. Vocabulary growth remains dependent on instructional coherence, learner engagement, and sustained pedagogical support.

#### 4.5 Integrated Framework for Informal AI-Mediated EFL Vocabulary Instruction

The four components of the framework are integrated into a cohesive and cyclical model. Instructional planning occupies the central position, linking teacher decision-making with informal AI use. Through planning, AI-generated resources are transformed into pedagogically meaningful tasks that shape learner engagement. Engagement, in turn, supports vocabulary development, which feeds back into subsequent instructional decisions and planning cycles.

This dynamic structure reflects the iterative nature of teaching practice, where planning, implementation, and reflection continuously interact. By positioning AI as a mediated planning resource rather than an autonomous instructional force, the framework highlights the centrality of teacher agency in digital pedagogy. Figure 1 presents a visual representation of this framework, illustrating the relationships among teacher decision-making, informal AI-mediated instructional planning, learner engagement, and vocabulary development.

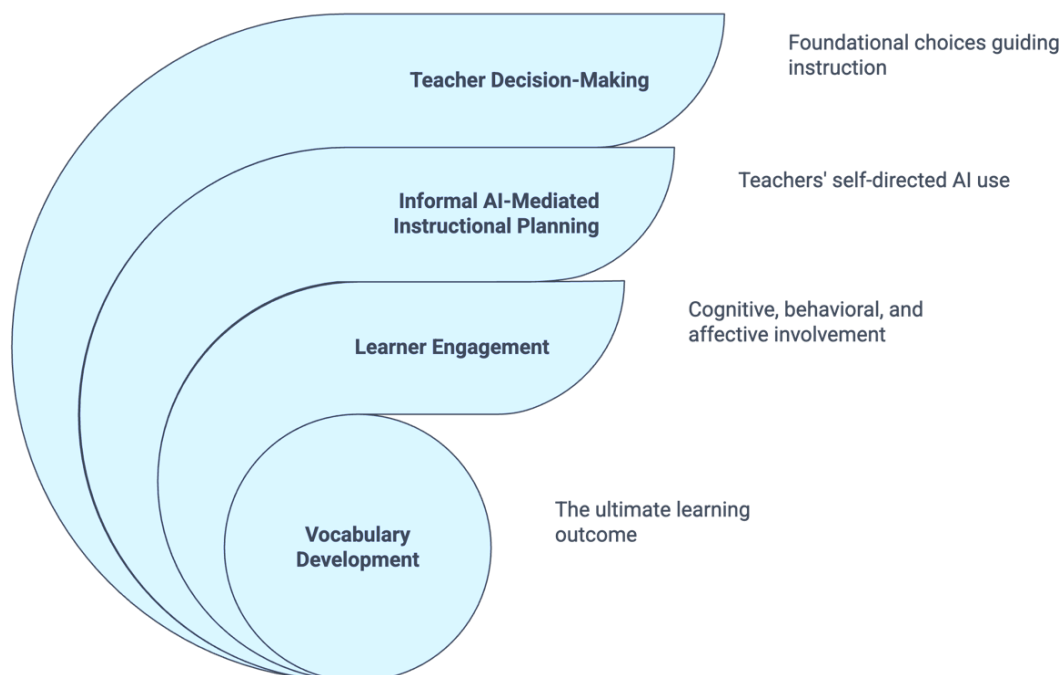


Figure 1. A teacher-centered informal AI-mediated EFL vocabulary instruction

## 5. Conclusion

This conceptual study has proposed a teacher-centered framework for informal AI-mediated EFL vocabulary instruction that addresses a critical gap in current research on AI in language education. Rather than emphasizing learners' direct interaction with AI tools, the framework repositions instructional planning as the central mediating process through which teachers transform AI-generated resources into pedagogically meaningful learning opportunities. In doing so, the study challenges technology-centered narratives of AI integration and reaffirms the central role of teacher agency in digital pedagogy.

By synthesizing insights from vocabulary acquisition theory, digital pedagogy, teacher cognition, and technology-enhanced language learning, the framework offers a coherent explanation of how informal AI use can support vocabulary development when guided by

professional judgment. AI is conceptualized not as an autonomous instructional agent, but as a supportive planning resource whose educational value emerges through teachers' decisions regarding task design, sequencing, and contextual adaptation. This perspective aligns AI integration with established principles of vocabulary learning, including meaningful exposure, repetition, and contextualized use.

This study contributes theoretically by articulating instructional planning as a mediating mechanism that links teacher decision-making, informal AI use, learner engagement, and vocabulary development. By conceptualizing teachers' informal engagement with AI as a form of professional practice, the framework extends discussions of digital pedagogy and highlights the potential of bottom-up, context-sensitive innovation in EFL instruction, particularly in settings where formal guidance on AI use remains limited.

As a conceptual model, the framework does not claim empirical generalizability. Instead, it provides a theoretically grounded lens for future empirical research examining how teachers enact informal AI-mediated instructional planning across diverse educational contexts. Subsequent studies may explore how teacher beliefs, institutional conditions, and digital literacy influence the sustainability and effectiveness of AI-mediated pedagogy over time.

In conclusion, meaningful integration of AI in EFL vocabulary instruction depends not on the technology itself, but on how it is mediated through thoughtful instructional planning. By centering teachers as designers and decision-makers, the proposed framework offers a human-centered and pedagogically grounded pathway for understanding and advancing AI use in language education.

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## References

- [1] I. S. P. Nation, *Learning Vocabulary in Another Language*, 3rd ed. Cambridge, U.K.: Cambridge University Press, 2022.
- [2] N. Schmitt and D. Schmitt, *Vocabulary in Language Teaching*, 2nd ed. Cambridge, U.K.: Cambridge University Press, 2020.
- [3] J. S. Lee, "Informal digital learning of English and perceptions of using English as an international language materials," *ReCALL*, vol. 36, no. 1, pp. 77–93, 2024.
- [4] X. Zhang and S. Liu, "Revisiting informal digital learning of English: A structural equation modeling approach," *Computer Assisted Language Learning*, vol. 35, no. 5–6, pp. 1039–1061, 2022.
- [5] Y. Liu, R. Darvin, and Q. Ma, "Personalized learning through gamification: A ChatGPT approach to EFL vocabulary acquisition," *Language Learning & Technology*, vol. 28, no. 1, pp. 1–20, 2024.
- [6] L. N. Aniq and N. A. Drajadi, "Investigating EFL teachers' perceptions of their TPACK development," *Computer Assisted Language Learning*, vol. 32, no. 7, pp. 749–764, 2019.

- [7] S. T. Taopan, "TPACK framework: Challenges and opportunities in EFL classrooms," *Journal of English Language Teaching and Linguistics*, vol. 5, no. 2, pp. 205–222, 2020.
- [8] E. Jaakkola, "Designing conceptual articles: Four approaches," *AMS Review*, vol. 10, no. 1, pp. 18–26, 2020.
- [9] S. D. Reese, "Writing the conceptual article: A practical guide," *Digital Journalism*, vol. 10, no. 1, pp. 1–18, 2022.
- [10] N. Schmitt, *Researching Vocabulary: A Vocabulary Research Manual*. London, U.K.: Palgrave Macmillan, 2010.



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