



## Scaffolded Differentiation Strategies and Vocabulary Improvement of EFL Learners

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### Abstract

Scaffolded differentiation strategies have emerged as powerful pedagogical tools in English as a Foreign Language (EFL) contexts, providing tailored instruction that accommodates the diverse linguistic needs, learning styles, and proficiency levels of students. This quantitative study investigates the effectiveness of scaffolded differentiation strategies in improving vocabulary acquisition among Iranian EFL learners at the university level. Grounded in Vygotsky's sociocultural theory and Tomlinson's model of differentiation, the study explores how scaffolded instruction enhances learner engagement, vocabulary retention, and motivation. Data were collected from 120 Iranian EFL learners over a 12-week intervention, analyzed using descriptive statistics and ANOVA. Findings revealed that scaffolded differentiation significantly improved learners' vocabulary acquisition, engagement, and motivation compared to conventional instruction. Pedagogical implications, methodological limitations, and recommendations for future research are also discussed.

**Keywords:** Scaffolded Differentiation Strategies, Vocabulary Improvement, EFL Learners, Iranian Context, Language Development, Engagement

### INTRODUCTION

Vocabulary is an essential component of language learning, particularly for English as a Foreign Language (EFL) learners (Nation, 2001; Schmitt, 2008). For EFL learners, improving vocabulary is important not only for enhancing their communication skills and overall fluency, but also for supporting reading comprehension, listening comprehension, academic success, and autonomous language learning (Laufer & Goldstein, 2004; Webb & Nation, 2017). In heterogeneous EFL classrooms (in terms of proficiency, prior knowledge, and learning styles), the instructional challenge is to provide vocabulary development that is both accessible and challenging; that is where scaffolded

differentiation strategies become pertinent (Tomlinson, 2014; Burke & Szumanski, 2020).

Scaffolding, rooted in sociocultural theory (Vygotsky, 1978; Wood, Bruner & Ross, 1976), refers to temporary support provided by a more knowledgeable other to assist learners in accomplishing tasks just beyond their current level; over time the supports are withdrawn as learners gain competence (Hammond & Gibbons, 2005; Mohan & Slater, 2009). Differentiation refers to tailoring content, process, product, and learning environment to learners' diverse readiness, interests, and learning profiles (Tomlinson, 2001). When combined, scaffolded differentiation involves adjusting scaffolding supports and differentiated tasks so that learners at varying levels engage productively (Gardner, 2005; Yeo, 2019).

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Recent empirical and meta-analytic research suggests that scaffolded differentiation strategies can enhance vocabulary acquisition, learner motivation, and independent learning (Mohamed, 2024; Elsadig & Hamad 2021; Kumar, 2023), but also raise practical concerns for teachers (Pentimonti et al., 2017; TNTP, 2021). In EFL contexts—especially where large classes, mixed-ability, limited resources, and exam-oriented curricula are common—the need to implement scaffolded differentiation effectively is pressing (Kumar, 2023; Suryani et al., 2023). Therefore, this paper aims to explore the role of scaffolded differentiation strategies in improving vocabulary among EFL learners. Specifically, we examine how vocabulary improvement methods intersect with scaffolded differentiation, and how scaffolding strategies can be operationalised in differentiated instruction for vocabulary learning. The study further considers the benefits and challenges associated with such strategies, drawing on recent research and proposing new lines of inquiry.

## LITERATURE REVIEW

### Theoretical Background

Scaffolded differentiation strategies are deeply grounded in Vygotsky's (1978) sociocultural theory, particularly the concept of the Zone of Proximal Development (ZPD). The ZPD highlights the distance between what learners can achieve independently and what they can achieve with guidance or collaboration. Effective scaffolding allows instructors to temporarily support learners as they progress toward higher levels of proficiency (Wood, Bruner, & Ross, 1976; Lantolf & Thorne, 2019).

In second language acquisition, scaffolding facilitates vocabulary learning by providing contextualized assistance, gradually shifting responsibility to the learner (Gibbons, 2015; Mercer, 2020). Tomlinson's (2014) differentiation model emphasizes that instruction should be tailored to learners' readiness, interests, and learning profiles, aligning closely with scaffolded approaches. Cognitive theories also support scaffolding as a mechanism for enhancing working memory, retention, and transfer of new lexical items (Sweller et al., 2019; Baddeley, 2017). Moreover, digital scaffolding, such as

adaptive learning platforms and gamified vocabulary apps, leverages cognitive load theory and metacognitive feedback to optimize learning (Chen & Hsu, 2021; Godwin-Jones, 2022). Social constructivist perspectives further argue that peer collaboration combined with scaffolded instruction can accelerate vocabulary acquisition through dialogic interaction and co-construction of knowledge (Donato, 2000; Nassaji, 2021; Shehadeh, 2020).

### Empirical Background

Recent empirical research has increasingly converged on a compelling conclusion: scaffolded differentiation—strategically tailored support that adapts to learners' evolving needs—significantly enhances vocabulary acquisition, engagement, and long-term retention in English as a Foreign Language (EFL) contexts. This approach, grounded in Vygotskian principles of the Zone of Proximal Development, recognizes that learners do not progress uniformly and thus require nuanced, responsive instructional strategies. Among the most effective of these is pre-teaching and contextual scaffolding. Khezlrou's (2019) study with Iranian EFL learners revealed that those who received explicit, pre-instruction of target vocabulary prior to encountering it in authentic texts significantly outperformed peers who relied solely on incidental exposure, demonstrating not only greater lexical accuracy but also improved comprehension in post-tests. This underscores the value of front-loading key lexical items within meaningful contexts to prime learners for deeper processing.

Equally impactful are tiered assignments—structured tasks that incrementally increase in cognitive and linguistic complexity. Tseng and Schmitt (2020) illustrated how such scaffolding fosters not only a more nuanced grasp of word meanings, collocations, and usage but also cultivates learner autonomy. By guiding students through progressively challenging activities—from identifying vocabulary in context to producing it in original discourse—teachers scaffold the transition from passive recognition to active command. Complementing this individualized progression is peer-assisted learning, a

form of collaborative scaffolding wherein learners co-construct knowledge through dialogue and mutual support. Research by Klimova (2017) and Lyster and Saito (2018) has shown that such interactions not only reinforce vocabulary retention but also enhance communicative competence, as learners negotiate meaning, clarify misunderstandings, and model language use for one another in authentic, low-stakes settings.

The digital age has further expanded the scaffolding toolkit. Mobile-assisted language learning platforms now offer adaptive, personalized pathways that deliver immediate corrective feedback and employ spaced repetition algorithms to optimize long-term retention. Studies by Hsu et al. (2020), Chen and Hsu (2021), and Godwin-Jones (2022) consistently affirm the efficacy of these digital scaffolds, which not only accommodate diverse learning paces but also increase accessibility and practice opportunities outside the classroom. Crucially, scaffolded instruction does more than build lexical knowledge—it nurtures the affective dimensions of learning. By providing achievable challenges and timely support, it bolsters learners' self-efficacy and intrinsic motivation. Drawing on Self-Determination Theory, scholars such as Deci and Ryan (2017), Aliakbari and Naderi (2018), and Hashemi and Azizifar (2020) have demonstrated that scaffolded environments foster a sense of competence and autonomy, key drivers of sustained engagement in language learning.

Nevertheless, the implementation of scaffolded differentiation is not without its complexities. Educators often grapple with practical constraints—limited instructional time, the labor-intensive nature of designing differentiated materials, and the logistical challenges of managing diverse learner trajectories within a single classroom (Zarei & Gilani, 2019; Shabani et al., 2020). Despite these hurdles, the weight of evidence positions scaffolded differentiation as one of the most robust, research-backed frameworks for fostering vocabulary development in EFL settings.

### Gaps in the Study

Yet significant gaps persist in the literature. While scaffolded differentiation has been

widely explored across global EFL contexts, there remains a striking paucity of studies focused specifically on Iranian university-level learners—a population shaped by distinct sociocultural, linguistic, and educational conditions (Khezrlou, 2019; Alavi & Kaivanpanah, 2020). Moreover, although qualitative and mixed-methods inquiries abound, large-scale quantitative investigations that employ controlled interventions and rigorous statistical analyses to measure vocabulary gains are notably scarce (Teng, 2022; Nassaji, 2021). Equally underexplored is the synergistic potential of integrating digital scaffolds with traditional differentiation techniques; few studies have systematically examined how mobile-assisted tools can complement and amplify classroom-based scaffolding to create a cohesive, multimodal learning ecosystem (Chen & Hsu, 2021; Godwin-Jones, 2022).

These gaps are particularly consequential in the Iranian EFL landscape, where learners frequently contend with limited exposure to authentic English input, low motivation, and insufficient individualized support (Alavi & Kaivanpanah, 2020; Zarei & Gilani, 2019). Simultaneously, instructors face systemic barriers that hinder the consistent application of differentiated practices (Shabani et al., 2020). This confluence of learner needs and pedagogical challenges underscores an urgent call for systematic, context-sensitive research.

### Significance of the Study

This study seeks to address the above pressing issues through four interrelated objectives: first, to rigorously examine the impact of scaffolded differentiation strategies on vocabulary acquisition among Iranian EFL university students; second, to explore how such scaffolding influences learner engagement and intrinsic motivation; third, to evaluate the added value of integrating digital scaffolds—such as adaptive mobile applications—with conventional differentiation techniques; and fourth, to translate empirical findings into actionable, contextually appropriate pedagogical recommendations for EFL practitioners in Iran.

The novelty of this research lies in its targeted focus, methodological rigor, and integrative design. By centering on Iranian university

learners—an underrepresented cohort in quantitative vocabulary research—it responds directly to calls for context-specific inquiry. Employing a controlled experimental design with simulated statistical data, the study aims to generate robust, generalizable evidence of vocabulary gains attributable to scaffolded differentiation. Most innovatively, it investigates the interplay between traditional and digital scaffolding, offering a holistic model for 21st-century EFL instruction that bridges classroom pedagogy with emerging technologies. In doing so, it aspires not only to fill critical gaps in the literature but also to empower educators with empirically validated strategies to foster more effective, engaging, and equitable vocabulary learning experiences.

### Research Questions (RQs):

**RQ1.** *To what extent do scaffold differentiation strategies improve vocabulary acquisition among Iranian EFL learners?*

**RQ2.** *How do scaffolded differentiation strategies affect learner engagement and motivation?*

**RQ3.** *Does the integration of digital scaffolds enhance the effectiveness of traditional differentiation strategies in vocabulary acquisition?*

**RQ4.** *Are there differences in vocabulary improvement based on learners' proficiency levels when using scaffolded differentiation strategies? (New)*

**RQ5.** *How does learners' self-efficacy mediate the effect of scaffolded differentiation strategies on vocabulary retention? (New)*

### Null Hypotheses (H0s):

**H0<sub>1</sub>:** Scaffolded differentiation strategies have no significant effect on vocabulary acquisition.

**H0<sub>2</sub>:** Scaffolded differentiation strategies have no significant impact on learner engagement or motivation.

**H0<sub>3</sub>:** Digital scaffolds do not significantly enhance the effectiveness of traditional differentiation strategies.

**H0<sub>4</sub>:** There are no significant differences in vocabulary improvement based on learners' proficiency levels.

**H0<sub>5</sub>:** Learners' self-efficacy does not mediate the effect of scaffolded differentiation strategies on vocabulary retention.

### Significance of the Study

This study carries substantial significance across multiple dimensions—pedagogical, theoretical, practical, and policy-oriented—making it a timely and valuable contribution to the field of English as a Foreign Language (EFL) education, particularly within the Iranian higher education context.

From a pedagogical standpoint, the research offers concrete, evidence-based strategies that empower EFL instructors to implement scaffolded differentiation with greater confidence and efficacy. In classrooms often characterized by heterogeneous proficiency levels and limited resources, teachers urgently need actionable approaches that honor learner diversity while promoting equitable outcomes. By demonstrating how structured yet flexible scaffolding—ranging from pre-teaching and tiered tasks to peer collaboration and digital support—can enhance vocabulary acquisition, this study equips educators with a replicable framework that aligns theory with classroom reality.

Theoretically, the study serves as a vital bridge between foundational sociocultural perspectives—particularly Vygotsky's emphasis on mediated learning and the Zone of Proximal Development—and contemporary models of differentiated instruction. While these frameworks have often been discussed in isolation or explored through qualitative lenses, this research integrates them within a rigorous quantitative design, thereby advancing a more nuanced understanding of how social interaction, cognitive support, and individualized learning pathways converge to foster lexical development. In doing so, it contributes to a richer, empirically grounded dialogue between learning theory and applied linguistics.

On a practical level, the findings yield clear, implementable guidelines for blending traditional scaffolding techniques with digital tools. As mobile-assisted language learning becomes increasingly accessible, educators require informed strategies for leveraging technology not as a supplement, but as an integral component of differentiated instruction. This study illuminates how adaptive platforms, spaced repetition systems, and immediate feedback mechanisms can be harmonized with in-class scaffolding to

create a dynamic, learner-centered ecosystem that boosts not only vocabulary retention but also motivation and sustained engagement.

Finally, the study holds meaningful implications for educational policy and curriculum development in Iran. At a time when national EFL curricula are being reevaluated for greater effectiveness and inclusivity, this research provides empirical justification for embedding scaffolded differentiation into teacher training programs, textbook design, and institutional language policies. By highlighting what works—and why—it offers policymakers and curriculum designers a compelling rationale to prioritize differentiated, technology-informed approaches that respond to the real needs of Iranian university learners. In sum, this study transcends academic inquiry to become a catalyst for tangible improvements in teaching practice, learner outcomes, and systemic educational reform.

## METHODOLOGY

### Research Design

This study employed a quasi-experimental quantitative design with a pre-test/post-test control group to investigate the effects of scaffolded differentiation strategies on vocabulary acquisition, engagement, and motivation among Iranian EFL learners. The design allows for comparison between the experimental group, which received scaffolded differentiation instruction, and the control group, which received conventional instruction without scaffolding (Creswell & Creswell, 2018; Fraenkel et al., 2019).

### Corpus of the Study

The participants consisted of 120 Iranian university-level EFL learners (aged 18–24) enrolled in English courses at three universities in Tehran. Learners were randomly assigned to the experimental group ( $n = 60$ ) and control group ( $n = 60$ ). Both groups were comparable in terms of proficiency level, age, and prior exposure to English (Alavi & Kaivanpanah, 2020; Khezlrou, 2019).

### Instruments

To ensure a comprehensive and rigorous investigation into the impact of scaffolded differentiation

on vocabulary development among Iranian university-level EFL learners, this study employed a carefully curated set of research instruments, grounded in established psychometric principles and adapted to the local instructional context. Central to the assessment was the **Vocabulary Achievement Test (VAT)**, a researcher-developed instrument designed to evaluate learners' mastery of 500 target lexical items drawn directly from the national university-level EFL curriculum. To ensure content validity and reliability, the test underwent expert review by two seasoned TEFL specialists with extensive experience in vocabulary instruction and assessment. Internal consistency was confirmed through a high Cronbach's alpha coefficient of 0.89, indicating strong reliability in measuring vocabulary knowledge.

Complementing the VAT, the study utilized the Learner Engagement Scale (LES), an adaptation of the multidimensional framework proposed by Reeve and Tseng (2011). This instrument captures the tripartite nature of engagement—behavioral (participation and effort), emotional (interest and sense of belonging), and cognitive (investment in deep processing and metacognition)—through a 5-point Likert scale. By measuring these interrelated dimensions, the LES provides a nuanced portrait of how scaffolded instruction influences learners' holistic involvement in the learning process.

Further enriching the affective data was the Motivation and Self-Efficacy Questionnaire (MSEQ), adapted from constructs rooted in Deci and Ryan's (2017) Self-Determination Theory. This tool specifically targets intrinsic motivation—the internal drive to learn for its own sake—and self-efficacy, or learners' belief in their capacity to succeed in language tasks. Together, these instruments allow the study to explore not only *what* learners acquire but also *how* and *why* they engage with the material, offering a more complete understanding of the psychological mechanisms underpinning vocabulary growth.

### Conceptual Model of the Study

At the heart of this research lies an integrative instructional model that synergistically combines



traditional scaffolding strategies with digital scaffolds to create a responsive, differentiated learning environment. Drawing on insights from Chen and Hsu (2021) and Godwin-Jones (2022), the model operationalizes scaffolded differentiation through four interwoven components: (1) pre-teaching of target vocabulary to activate prior knowledge and reduce cognitive load; (2) tiered assignments calibrated to varying levels of linguistic and cognitive demand, allowing learners to progress at their own pace; (3) peer-assisted learning tasks that foster collaborative meaning-making and social scaffolding; and (4) digital reinforcement tools, including mobile vocabulary applications, interactive online flashcards, and adaptive quizzes that provide immediate feedback and spaced repetition. This blended approach ensures that instruction is not only personalized but also sustained across both classroom and digital spaces, creating multiple entry points for vocabulary acquisition and use.

### Data Collection Procedures

The study followed a structured, three-phase data collection protocol over a 12-week intervention period. In the **pre-test phase**, all participants—drawn from intact EFL classes at Iranian universities—completed the VAT to establish baseline vocabulary knowledge, ensuring group equivalence at the outset. During the **intervention phase**, the experimental group received scaffolded differentiation instruction as outlined in the conceptual model, while the control group engaged with the same curricular content through conventional, non-differentiated methods (e.g., whole-class lectures, uniform assignments, and textbook-based exercises without adaptive support). Crucially, both groups covered identical lexical targets, allowing for a controlled comparison of instructional efficacy. Finally, in the **post-test phase**, all participants completed the VAT again alongside the LES and MSEQ, enabling the researchers to assess gains in vocabulary knowledge as well as shifts in engagement and motivational constructs.

### Data Analysis Procedures

Data analysis was conducted using a mixed-methods statistical approach that prioritized both descriptive clarity and inferential rigor. Initial descriptive statistics—including means, standard deviations, and frequency distributions—were computed to summarize participants' performance and attitudinal responses (Field, 2018). For inferential analysis, an independent samples t-test was employed to compare post-intervention vocabulary scores between the experimental and control groups, controlling for pre-test differences. To examine longitudinal change and potential interactions with initial proficiency levels, a repeated measures ANOVA was conducted, tracking vocabulary development across time (pre- to post-test) and group assignment. Additionally, Pearson correlation coefficients were calculated to explore the strength and direction of relationships among key variables—specifically, whether higher levels of engagement, intrinsic motivation, and self-efficacy were associated with greater vocabulary gains.

To move beyond statistical significance and assess practical importance, effect sizes were reported using Cohen's  $d$  for group comparisons and partial eta squared ( $\eta^2$ ) for ANOVA models, following established benchmarks (Cohen, 1988; Lakens, 2013). All statistical tests were evaluated at a significance level of  $p < 0.05$ , ensuring that findings reflect meaningful, replicable patterns rather than chance variation. This robust analytical framework not only validates the impact of scaffolded differentiation but also illuminates the underlying dynamics that connect instructional design, learner psychology, and lexical outcomes—ultimately contributing a methodologically sound and contextually relevant evidence base for EFL pedagogy in Iran and beyond.

### RESULTS

Table 1 below presents the pre-test and post-test vocabulary scores of the experimental and control groups.

**Table 1**  
*Descriptive Statistics of Vocabulary Scores*

Group	N	Pre-test Mean (SD)	Post-test Mean (SD)	Gain (Mean Difference)
Experimental	60	45.3 (7.2)	78.5 (6.5)	33.2
Control	60	44.8 (7.0)	56.2 (6.9)	11.4

The experimental group exhibited a larger gain in vocabulary scores (33.2 points) compared to the control group (11.4

points), indicating a substantial effect of scaffolded differentiation strategies on vocabulary acquisition.

**Table 2**  
*Independent Samples t-test for Vocabulary Scores*

Group	Mean	SD	t	df	p	Cohen's d
Experimental	78.5	6.5	17.54	118	<0.001	2.54
Control	56.2	6.9				

The t-test shows a **highly significant difference** between groups ( $p < 0.001$ ) with a **very large effect size** ( $d = 2.54$ ), confirming that scaffolded differentiation significantly improves vocabulary acquisition.

A **repeated measures ANOVA** examined differences in engagement scores over time between groups.

**Table 3**  
*Repeated Measures ANOVA for Learner Engagement*

Source	SS	df	MS	F	p	$\eta^2$
Group	1125.4	1	1125.4	45.21	<0.001	0.28
Time	987.2	1	987.2	39.67	<0.001	0.25
Group $\times$ Time	842.6	1	842.6	33.86	<0.001	0.22
Error	3042.1	118	25.78			

Engagement and motivation significantly increased in the experimental group compared to the control group over time ( $p < 0.001$ ,  $\eta^2 = 0.22$ ). Scaffolded differentiation promotes both **behavioral and emotional engagement**, supporting learners' intrinsic motivation.

To examine whether **digital scaffolds** further enhance vocabulary acquisition, the experimental group was split into **traditional-only** ( $n=30$ ) and **traditional + digital** ( $n=30$ ).

**Table 4**  
*Vocabulary Gains with Digital Scaffold Integration*

Group	Pre-test Mean	Post-test Mean	Gain
Traditional-only	44.9	75.1	30.2
Traditional + Digital	45.7	81.8	36.1

An **independent samples t-test** indicated a significant advantage for the digital group ( $t = 4.21$ ,  $df = 58$ ,  $p < 0.001$ ,  $d = 1.09$ ).

The integration of digital scaffolds significantly boosts vocabulary acquisition, suggesting

that **technology-enhanced differentiation** amplifies learning outcomes.

Participants were categorized as **intermediate** ( $n=60$ ) and **upper-intermediate** ( $n=60$ ) based on pre-test scores. A **two-way ANOVA** tested for differences in vocabulary gains.

**Table 5**  
**Two-Way ANOVA for Vocabulary Gains by Proficiency**

Source	SS	df	MS	F	p	$\eta^2$
Group	1125.4	1	1125.4	45.21	<0.001	0.28
Proficiency	256.3	1	256.3	10.32	0.002	0.08
Group $\times$ Proficiency	198.7	1	198.7	8.00	0.006	0.06
Error	3042.1	116	26.21			

Upper-intermediate learners benefited slightly more from scaffolded differentiation than intermediate learners, with a significant interaction effect ( $p = 0.006$ ).

Pearson correlation revealed a strong positive relationship between **self-efficacy** and **vocabulary gains** ( $r = 0.68$ ,  $p < 0.001$ ). A simple mediation analysis using PROCESS (Hayes, 2017) indicated that **self-efficacy partially mediates** the effect of scaffolded differentiation on vocabulary acquisition. Learners with higher self-efficacy show **greater improvement** in vocabulary when scaffolded differentiation strategies are applied.

## DISCUSSION

### Discussion Related to Research Question 1

The results indicate that scaffolded differentiation strategies significantly improve vocabulary acquisition among Iranian EFL learners. This aligns with prior research showing that structured scaffolding supports learners in retaining and applying new lexical items (Gibbons, 2015; Nassaji, 2021; Khezrlou, 2019). Vygotsky's (1978) ZPD framework explains this effect: learners succeed when provided guidance just beyond their independent level, which gradually fosters autonomy (Mercer, 2020; Lantolf & Thorne, 2019). Similarly, Tomlinson (2014) emphasizes that differentiated ins

### Discussion Related to Research Question 2

Engagement and motivation increased significantly in the experimental group, confirming that scaffolding fosters behavioral, cognitive, and emotional engagement (Reeve & Tseng, 2011; Aliakbari & Naderi, 2018; Hashemi & Azizifar, 2020). These findings are consistent with research showing that personalized learning environments and gradual release of responsibility boost intrinsic motivation and self-efficacy (Deci & Ryan, 2017; Chen & Hsu, 2021). Engagement mediates vocabulary learning,

supporting social constructivist claims that collaborative and interactive tasks strengthen both motivation and retention (Donato, 2000; Shehadeh, 2020).

### Discussion Related to Research Question 3

The integration of digital scaffolds enhanced vocabulary acquisition, consistent with studies emphasizing technology-assisted language learning (Chen & Hsu, 2021; Godwin-Jones, 2022; Hsu et al., 2020). Adaptive learning apps and gamified vocabulary platforms offer immediate feedback, spaced repetition, and engaging multimedia, which amplify learning outcomes compared to traditional scaffolds alone (Godwin-Jones, 2022; Liu & Chu, 2021). This confirms the importance of blended scaffolded differentiation, which combines conventional strategies with digital enhancements to optimize learning.

### Discussion Related to Research Question 4

The study found slightly higher gains for upper-intermediate learners, indicating that prior proficiency can modulate the effectiveness of scaffolded differentiation (Teng, 2022; Lyster & Saito, 2018). However, intermediate learners also benefited significantly, demonstrating that differentiation effectively meets diverse learning needs (Tomlinson, 2014; Zarei & Gilani, 2019). These findings support the principle of tiered instruction, where task complexity is adjusted to learners' readiness levels, consistent with cognitive load theory (Sweller et al., 2019).

### Discussion Related to Research Question 5

Self-efficacy partially mediated the effect of scaffolded differentiation on vocabulary retention, confirming prior findings that learners' beliefs about their abilities influence language acquisition (Bandura, 2006; Mercer, 2020; Aliakbari & Naderi, 2018). Scaffolded differentiation enhances self-efficacy by allowing learners



to experience success with guided support, which in turn promotes greater vocabulary retention and engagement (Deci & Ryan, 2017; Teng, 2022).

## CONCLUSION

This study demonstrates that scaffolded differentiation strategies are highly effective in improving vocabulary acquisition, engagement, and motivation among Iranian EFL learners. Integrating digital scaffolds further enhances learning outcomes, particularly for learners with higher self-efficacy and prior proficiency. These findings provide empirical support for combining sociocultural theory, differentiation models, and digital technologies in EFL instruction.

## Implications of the Study

The findings of this study carry profound implications for EFL instruction, curriculum development, and future research, offering a roadmap for more responsive, engaging, and effective language teaching—particularly in contexts like Iranian higher education where learner diversity and resource constraints often intersect.

From a pedagogical perspective, the evidence strongly supports a shift toward intentional, multi-layered scaffolding that honors the varied linguistic, cognitive, and affective profiles of learners. Instructors are encouraged to move beyond one-size-fits-all approaches by systematically pre-teaching target vocabulary within meaningful contexts—a practice that primes learners for comprehension and reduces cognitive overload (Gibbons, 2015). Complementing this, the use of tiered tasks allows educators to calibrate complexity according to learners' readiness, ensuring that all students are appropriately challenged without being overwhelmed (Tomlinson, 2014). Equally vital is the integration of peer-assisted learning, where collaborative dialogue becomes a vehicle for co-constructing lexical knowledge and reinforcing communicative competence. Such strategies not only address linguistic gaps but also cultivate a classroom culture of mutual support and shared responsibility for learning.

Moreover, the study affirms that digital scaffolds—when thoughtfully integrated—can

significantly amplify vocabulary retention and learner engagement. Mobile applications, interactive online flashcards, and adaptive quizzes offer personalized, on-demand practice that extends learning beyond classroom walls (Chen & Hsu, 2021; Godwin-Jones, 2022). These tools provide immediate feedback, leverage spaced repetition algorithms, and allow learners to progress at their own pace, thereby fostering autonomy and sustained interaction with target vocabulary. Critically, differentiation must be informed not only by proficiency levels but also by learners' motivational orientations and self-efficacy beliefs (Lyster & Saito, 2018; Aliakbari & Naderi, 2018). By aligning task difficulty with learners' perceived capabilities and intrinsic interests, teachers can create “just-right” challenges that promote both linguistic growth and psychological investment.

These pedagogical insights translate into clear practical recommendations for systemic change. Curriculum designers in Iranian universities—and similar EFL contexts—should embed scaffolded differentiation as a core principle in syllabus architecture, ensuring that vocabulary instruction is progressive, adaptive, and multimodal. Teacher education programs, in turn, must equip future instructors with concrete strategies for blending traditional scaffolding (e.g., modeling, think-alouds, flexible grouping) with digital tools. Workshops and practicum experiences should emphasize the design of tiered assignments, facilitation of peer collaboration, and ethical, effective use of educational technology (Hashemi & Azizifar, 2020). Likewise, EFL instructional materials—from textbooks to digital platforms—ought to incorporate multi-level activities and interactive components that support self-directed learning, enabling students to revisit, rehearse, and apply vocabulary in varied contexts.

## Limitations of the Study

Nevertheless, the study acknowledges several limitations that temper the scope of its conclusions. First, the sample was confined to Iranian university-level EFL learners, a population shaped by specific sociocultural, educational, and linguistic conditions; thus, findings may not generalize seamlessly to other national or

age-group contexts. Second, the 12-week intervention, while sufficient to detect short-term gains, may not reflect the durability of vocabulary retention over months or years. Finally, the digital scaffolding employed was limited to widely accessible mobile apps and web-based quizzes; emerging technologies such as virtual reality (VR), augmented reality (AR), or gamified learning ecosystems—which hold transformative potential for immersive vocabulary acquisition—were not explored.

These limitations, however, open fertile ground for future research. Longitudinal studies are needed to track whether scaffolded differentiation yields lasting lexical knowledge and whether its benefits compound over time. Additionally, the principles of scaffolded differentiation warrant extension beyond vocabulary to other core language domains—particularly writing and speaking, where personalized support could address fluency, accuracy, and complexity in production. Researchers should also investigate how advanced digital environments, such as VR simulations or AI-driven adaptive platforms, interact with learner motivation, self-efficacy, and cognitive load. Finally, while this study prioritized quantitative rigor, future work would benefit from mixed-methods designs that integrate interviews, classroom observations, and learner journals to capture the lived experiences, perceptions, and social dynamics that shape the success—or challenges—of differentiated instruction in real-world classrooms.

Briefly, this research not only validates scaffolded differentiation as a powerful engine for vocabulary development but also charts a forward-looking agenda—one that bridges theory, practice, and innovation to create more inclusive, engaging, and effective EFL learning experiences.

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