Beyond Memorization: Enhancing Vocabulary Acquisition through Google Sites in Bilingual Pesantren Education

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Abstract

Vocabulary acquisition in Arabic as a foreign language within pesantren-based educational contexts continues to face persistent challenges due to the dominance of rote memorization practices that inadequately support deep semantic processing, long-term retention, and communicative readiness. This study aims to examine the pedagogical role of Google Sites–based digital instruction in moving beyond memorization by facilitating meaningful lexical processing, learner engagement, and vocabulary retention among students at SMP Bilingual Terpadu Pesantren Modern Al-Amanah Junwangi, Krian. Adopting a qualitative descriptive design, the study employed semi-structured interviews, classroom observations, and document analysis, involving 25 students and 5 Arabic language teachers. The findings indicate that the integration of Google Sites enhanced vocabulary retention through structured, multimodal, and contextualized content presentation, enabling deeper semantic processing compared to conventional memorization-based methods. The platform also contributed to increased learner motivation and affective engagement. However, the data reveal that students' spontaneous oral use of newly learned vocabulary remained limited and did not develop optimally. This suggests that while Google Sites effectively supports vocabulary retention and emerging readiness for use, full communicative acquisition requires sustained pedagogical mediation and integration with oral interaction practices. The study concludes that Google Sites–based digital instruction functions effectively as a supportive tool for Arabic vocabulary learning beyond mechanical memorization, yet its success is contingent upon teacher scaffolding and alignment with communicative language teaching principles. This research provides empirical insights into digital Arabic pedagogy in bilingual pesantren settings and recommends further investigation into long-term learning outcomes and the integration of digital platforms with productive language use.

Keywords: Arabic Language Acquisition, Bilingual Pesantren Education, Digital Learning Media, Vocabulary Retention

ملخص

اكتسابُ المفرداتِ في تعليمِ اللغةِ العربيةِ كلغةٍ أجنبيةٍ ضمنَ السياقاتِ التعليميةِ القائمةِ على نظامِ المعاهدِ الإسلامية لا يزالُ يواجهُ تحدّياتٍ مستمرّة، ويُعزى ذلك إلى هيمنةِ ممارساتِ الحفظِ الآلي التي لا تسهمُ إسهامًا كافيًا في دعمِ المعالجةِ الدلاليةِ العميقةِ، ولا في تحقيقِ الاحتفاظِ طويلِ الأمد، ولا في تنميةِ الجاهزيةِ التواصليةِ لدى المتعلّمين. وتهدفُ هذهِ الدراسةُ إلى فحصِ الدورِ التربويّ للتعليمِ الرقميّ القائمِ على منصة غوغل سايتسفي بتجاوزِ الحفظِ الميكانيكي، من خلالِ تيسيرِ المعالجةِ المعجميةِ ذاتِ المعنى، وتعزيزِ تفاعلِ المتعلّمين، ودعمِ الاحتفاظِ بالمفرداتِ لدى طلبةِ المدرسةِ المتوسطةِ الثنائيةِ المتكاملةِ في معهدِ الأمانةِ الإسلاميّ الحديثِ بجونوانغي، كرِيان. واعتمدتِ الدراسةُ المنهجَ الوصفيَّ النوعي، حيث استُخدمت المقابلاتُ شبهُ المهيكلة، والملاحظةُ الصفّية، وتحليلُ الوثائق، بمشاركةِ خمسةٍ وعشرينَ طالبًا وخمسةِ معلّمين للغةِ العربية. وأظهرتِ النتائجُ أنّ دمجَ منصةِ غوغل سايتسأسهمَ في تعزيزِ الاحتفاظِ بالمفرداتِ من

خلالِ عرضِ المحتوى بصورةٍ منظَّمة، ومتعدّدةِ الوسائط، ومقترنةٍ بالسياق، ممّا أتاحَ معالجةً دلاليةً أعمقَ مقارنةً بأساليبِ الحفظِ التقليدية. كما أسهمتِ المنصةُ في رفع دافعيةِ المتعلّمين وتعزيزِ تفاعلهم الوجداني. غيرَ أنّ البياناتِ كشفتْ أنّ الاستخدامَ الشفهيَّ العفويَّ للمفرداتِ المكتسَبةِ حديثًا ظلَّ محدودًا، ولم يتطوّر على نحوٍ أمثل. ويشيرُ ذلك إلى أنّ منصةَ غوغل سايتس، وإنْ كانتْ فاعلةً في دعمِ الاحتفاظِ بالمفرداتِ وبناءٍ جاهزيةٍ أوليةٍ لاستخدامها، فإنّ تحقيقَ الاكتسابِ التواصليِّ الكاملِ يظلُّ مرهونًا بتوسّطٍ تربويٍّ مستمرٍّ وبتكاملِها مع ممارساتِ التفاعلِ الشفهي. وتخلصُ الدراسةُ إلى أنّ التعليمَ الرقميَّ القائمَ على غوغل سايتسيؤدّي دورًا فعّالًا بوصفِه أداةً داعمةً لتعلّمِ المفرداتِ العربيةِ بما يتجاوزُ الحفظَ الآليَّ، غيرَ أنّ نجاحَه يعتمدُ على إسنادِ المعلّم (التدريج والدعم) وعلى اتساقِه مع مبادئِ تعليمِ اللغةِ التواصلي. كما تُسهمُ هذهِ الدراسةُ في تقديمِ معطياتٍ تجريبيةٍ حولَ بيداغوجيا تعليمِ العربيةِ الرقميةِ في البيئاتِ الثنائيةِ داخلَ المعاهدِ الإسلامية، وتوصي بإجراءِ دراساتٍ لاحقةٍ تتناولُ الآثارَ طويلةَ الأمدِ للتعلّم، وسبلَ دمجِ المنصّاتِ الرقميةِ مع الاستخدامِ اللغويِّ الإنتاجي.

الكلمات المفتاحية: اكتساب اللغة، إتقان المفردات، المعاهد الإسلامية، وسائل تعليمية

Introduction

Vocabulary mastery constitutes a core dimension of Arabic language acquisition, as both lexical breadth and depth directly shape learners' capacity to comprehend texts and produce accurate, fluent, and meaningful language.[1] Within second and foreign language acquisition research, vocabulary knowledge is consistently identified as a robust predictor of overall language proficiency and a foundational prerequisite for the development of receptive and productive skills. Insufficient lexical resources impose severe communicative constraints on learners, even when grammatical competence is relatively well developed. Consequently, ineffective vocabulary instruction not only undermines lexical growth but also impedes broader academic achievement and communicative performance.[2]

Despite its centrality, Arabic vocabulary acquisition remains a persistent pedagogical challenge for non-native learners, particularly in pesantren-based educational institutions. Vocabulary instruction in these contexts continues to rely heavily on mechanical memorization, translation-oriented practices, and decontextualized word lists. While such approaches may facilitate short-term recall, they are largely ineffective in promoting long-term retention, semantic depth, and functional

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[1] Fawzi Al Ghazali and Aysha Al Shamsi, "*Enhancing Lexical Acquisition and Linguistic Proficiency via Technological Means*," in Proceeding of the World Conference on Language Learning, vol. 1, (2024): 1–11. DOI: https://doi.org/10.33422/languageconf.v1i1.113

[2] Kemal Arslan, "*Teaching English Vocabulary: Innovative Methods*," Contemporary Research in Language and Linguistics 2, no. 1 (2024): 18. DOI: https://doi.org/10.62601/crll.v2i1.26

vocabulary use.[3] This instructional misalignment frequently results in low learner engagement, weak form–meaning integration, and limited transfer of lexical knowledge to authentic communicative contexts, thereby underscoring the urgent need for more sustainable and pedagogically sound instructional models.[4]

In response to these limitations, digital technology has gained increasing attention within the framework of Computer-Assisted Language Learning (CALL). Contemporary research demonstrates that well-designed digital learning environments, characterized by interactivity, multimodality, and structured engagement, can facilitate deeper lexical processing, strengthen form–meaning associations, and enhance long-term retention.[5] Digital platforms that integrate textual input, visual support, audio elements, and contextualized learning tasks are particularly effective in moving vocabulary instruction beyond rote memorization toward meaningful language use.

Empirical studies have increasingly confirmed the effectiveness of digital media in Arabic vocabulary learning. Amalia reported significant improvements in learners' vocabulary mastery through the use of the Kosbarab application at the secondary level.[6] Al-Maliki found that digital tools such as Quizlet, podcasts, and interactive comics enhanced learner motivation and supported long-term vocabulary retention.[7] Similarly, Taufik demonstrated that flashcard-based digital strategies strengthened vocabulary acquisition among primary learners through visual reinforcement and systematic repetition.[8] At the international level, Al-Hazmi showed that interactive multimedia environments substantially improved vocabulary retention and structural comprehension,[9] while Ahmad Nejad confirmed the positive impact of web-based learning platforms on language skills development and learner motivation.[10]

Despite these encouraging findings, several critical gaps remain in the existing literature. Prior studies predominantly focus on standalone applications, drill-oriented tools, or early educational stages, and are largely conducted outside pesantren contexts. Moreover, limited scholarly attention has been directed toward integrative web-based platforms that enable teachers to design structured,

[3] Hassan Rouhani and Ghasem Modarresi, "*The Role of Translation-Based, Meaning-Based, and Hint-Based Instructions in Vocabulary Acquisition: A Mixed-Methods Study*," Iranian Journal of Applied Language Studies 15, no. 1 (2023): 83–100. DOI: https://doi.org/10.22111/ijals.2023.38276.2156

[4] Isobel Kai-Hui Wang and Andrew D Cohen, "*Investigating Learner Engagement in Strategy Instruction Focused on Vocabulary for Academic Writing: A Case Study*," System 99 (2021): 102501. DOI: https://doi.org/10.1016/j.system.2021.102501

[5] Naif Alqurashi, "*Enhancing Language Acquisition: Integrating Traditional and Digital Methods for Learner Engagement*," ESI Preprints (European Scientific Journal, ESJ) 21, no. 2 (2025): 41. DOI: https://doi.org/10.19044/esj.2025.v21n2p41

[6] Rifda Amalia, Muhammad Afthon Ulin Nuha, and Afif Kholisun Nashoih, "*Development of Kosbarab Learning Media to Improve Arabic Vocabulary Mastery of Elementary Level Students Based on Android Construct 2*," Al-Ta'rib: Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya 10, no. 2 (2022): 145–58. DOI: https://doi.org/10.23971/altarib.v10i2.4529

[7] Reima Al-Jarf, "*Online Vocabulary Tasks for Engaging and Motivating EFL College Students in Distance Learning during the Pandemic and Post-Pandemic*," International Journal of English Language Studies (IJELS) 4, no. 1 (2022): 14–24. DOI: https://doi.org/10.32996/ijels.2022.4.1.2

[8] Taufik et al., "*Integrating the Whoop It Up Strategy with the AIR (Auditory, Intellectually, Repetition) Learning Model in Arabic Language Learning*," Arabiyat: Jurnal Pendidikan Bahasa Arab dan Kebahasaaraban 10, no. 2 (2023): 163–77. DOI: https://doi.org/10.15408/a.v10i2.35973

[9] Khaled Alhazmi, "*The Effect of Multimedia on Vocabulary Learning and Retention*," World Journal of English Language 14, no. 6 (2024): 57. DOI: https://doi.org/10.5430/wjel.v14n6p390

[10] Mohammad Ahmadnejad, Naseh Rahimi, and Rozhin Ghaslani, "*The Effect of Web 2.0 Technology on Language Achievement and Self-Regulated Learning of EFL Learners: A Case of WhatsApp*," Journal of English Language Teaching and Learning 16, no. 33 (2024): 46–73. DOI: https://doi.org/10.22034/elt.2024.60600.2613

contextualized, and institutionally adaptable learning environments. Consequently, the pedagogical potential of platforms such as Google Sites, particularly within bilingual pesantren settings characterized by distinctive linguistic, cultural, and instructional dynamics, remains empirically underexplored.

Accordingly, this study seeks to examine the effectiveness of Google Sites–based digital instruction in enhancing Arabic vocabulary mastery among non-native learners in a bilingual pesantren environment. Specifically, it investigates the impact of Google Sites integration on learners' vocabulary development, lexical retention, and engagement, while also identifying pedagogical challenges encountered during its instructional implementation. It is hypothesized that Google Sites–mediated instruction significantly outperforms conventional vocabulary teaching approaches in improving vocabulary mastery, long-term retention, and learner engagement.

By providing empirical evidence from a context-specific and underrepresented educational setting, this study contributes to the advancement of Computer-Assisted Language Learning based pedagogy in Arabic language education. The findings are expected to enrich theoretical discussions on digital vocabulary instruction and offer practical implications for educators seeking to design sustainable, context-sensitive digital learning environments for Arabic vocabulary acquisition.

Method

This study employed a qualitative descriptive design to examine the implementation of Google Sites in Arabic vocabulary instruction within a bilingual pesantren context. A qualitative approach was selected to explore participants' experiences and classroom practices in their natural setting.[11] The study focused on identifying patterns of vocabulary retention, learner engagement, and instructional challenges arising from the integration of digital media, rather than on statistical measurement.

The research was conducted at SMP Bilingual Terpadu Pesantren Modern Al-Amanah, Junwangi, Krian, where Google Sites was systematically integrated into Arabic vocabulary instruction. Vocabulary materials were thematically organized and delivered through multimodal content, including text, images, audio, and contextualized examples. Instruction emphasized repeated exposure and communicative application of vocabulary in authentic classroom interaction, ensuring ecological validity.

Participants consisted of 25 lower-secondary students and five Arabic language teachers directly involved in Google Sites–based instruction. Purposive sampling was applied to select information-rich participants with direct experience relevant to the research focus.

Data were analyzed thematically through systematic coding and categorization of interview transcripts, observation notes, and instructional documents.[12] Themes related to learner engagement, vocabulary retention, learning strategies, and instructional constraints were identified and refined through iterative comparison across data sources.

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[11] Cheryl Poth, "*The Curious Case of Complexity: Implications for Mixed Methods Research Practices*," International Journal of Multiple Research Approaches 10, no. 1 (2018): 75. DOI: https://doi.org/10.29034/ijmra.v10n1a27

[12] Virginia Braun and Victoria Clarke, "*Using Thematic Analysis in Psychology*," Qualitative Research in Psychology 3, no. 2 (2006): 77–101. DOI: https://doi.org/10.1191/1478088706qp063oa

To enhance credibility, methodological triangulation was employed by integrating interviews, observations, and document analysis. Member checking was conducted to verify interpretive accuracy and minimize researcher bias. These procedures ensured the trustworthiness and analytical rigor of the findings.

Result and Discussion

A. Multimodal Mediation of Vocabulary Retention

This subchapter examines how Google Sites mediates Arabic vocabulary retention through multimodal design, contextualized exposure, and learner autonomy. Drawing sequentially on interview data (Table 1) and classroom observations (Table 2), the discussion elucidates not only the observed improvements in vocabulary retention but also the cognitive and pedagogical mechanisms underlying these outcomes.

Table 1. Interview Excerpts Related to Improved Vocabulary Retention (n = 10)

No	Informan	Description
1	Teacher	"Students are able to review vocabulary without my instruction; they access Google Sites independently."
2	Teacher	"During oral tests, many students used vocabulary that they previously found difficult."
3	Student A	"If I forget the meaning, I just reopen it on Google Sites; I don't need to search in books."
4	Student B	"Example sentences really help me understand when a word is used."
5	Student C	"The illustrations make me remember longer, especially matching words."
6	Student D	"Words that were difficult before, now I can use them to write dialogues."
7	Student E	"I study from the tabs, and I can repeat the vocabulary again and again."
8	Student F	"I memorize faster because of the pronunciation audio."
9	Student G	"If I only see vocabulary lists on the board, I often forget; Google Sites makes it easier."
10	Student H	"I can quickly review last week's material; the layout is neat and easy to find."

Table 1 presents interview excerpts from teachers and students indicating consistent gains in vocabulary retention following the integration of Google Sites. A prominent pattern emerging from teacher responses is the reduced dependence on direct instructional control. Teachers reported that students independently accessed vocabulary materials and demonstrated improved lexical

performance during oral assessments. This shift from teacher-regulated input to learner-initiated retrieval constitutes a critical condition for sustainable vocabulary acquisition, as it enables repeated exposure and consolidation beyond classroom boundaries.

Student responses further clarify the mechanisms supporting this improvement. Learners emphasized ease of access, systematic layout, and the availability of illustrations, example sentences, and pronunciation audio. From the perspective of Cognitive Load Theory, these features reduced extraneous cognitive load by minimizing unnecessary search processes and fragmented attention. Consequently, learners' cognitive resources could be allocated to semantic integration and schema construction rather than surface-level memorization.[13]

These findings are theoretically reinforced by Mayer's Cognitive Theory of Multimedia Learning, which posits that learning is optimized when verbal and non-verbal information is coherently integrated. The coordinated presentation of text, visuals, and audio in Google Sites activated dual processing channels, facilitating deeper encoding of lexical items. Students' reports of faster memorization and prolonged retention suggest that vocabulary was encoded as integrated mental representations rather than isolated lexical forms. This effect is particularly salient in foreign language contexts, where phonological unfamiliarity often constrains lexical retention.

Furthermore, the inclusion of example sentences played a crucial role in promoting contextualized meaning construction. Consistent with depth of processing theory and the involvement load hypothesis, vocabulary presented within authentic syntactic and pragmatic contexts required learners to engage with meaning, usage constraints, and communicative function. Such high-involvement conditions are empirically associated with durable retention.[14] Accordingly, the interview data indicate that Google Sites facilitated cognitively efficient, semantically rich, and increasingly autonomous vocabulary learning.

While interview findings capture learners' perceptions and cognitive engagement, classroom observations (Table 2) provide behavioral validation of vocabulary retention. In sentence-writing tasks, a majority of students incorporated more than six newly learned lexical items within a single paragraph, indicating a transition from receptive familiarity to productive competence. This integration suggests that lexical knowledge had been sufficiently consolidated to support active language production.

Table 2. Observational Data on Vocabulary Use in Learning

No	Observation	Activity	Findings
1	O1	Sentence-writing exercise	13 of 18 students used more than six new vocabulary items in one paragraph
2	O2	Oral class activity	Students produced new vocabulary on the topic of *hiwayah* without teacher prompting
3	O3	Google Sites activity	Students were observed revisiting the previous week's vocabulary before starting writing tasks

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[13] Janice Light and Peter Lindsay, "*Cognitive Science and Augmentative and Alternative Communication*," Augmentative and Alternative Communication 7, no. 3 (1991): 186–203. DOI: https://doi.org/10.1080/07434619112331275893

[14] Jan H Hulstijn and Batia Laufer, "*Some Empirical Evidence for the Involvement Load Hypothesis in Vocabulary Acquisition*," Language Learning 51, no. 3 (2001): 539–58. DOI: https://doi.org/10.1111/0023 8333.00164

Oral classroom activities further revealed spontaneous use of target vocabulary without teacher prompting.[15] From a psycholinguistic standpoint, this unprompted production reflects lexical automatization, wherein access to vocabulary becomes rapid and internally regulated.[16] Automatization emerges through repeated retrieval and meaningful use, both of which were structurally supported by the Google Sites environment. The absence of instructional cues indicates that lexical access was no longer externally driven, but cognitively routinized.

In addition, observations showed that students routinely revisited vocabulary from previous weeks before initiating new tasks. This behavior constitutes naturally occurring spaced retrieval practice, a learning strategy robustly associated with long-term memory consolidation.[17] The accessible and well-organized architecture of Google Sites enabled learners to engage in retrieval cycles without explicit instructional pressure, thereby reinforcing memory traces through repeated activation over time.

From an ecological learning perspective, these patterns indicate that Google Sites functioned not merely as a delivery platform, but as a learning environment that shaped learner behavior.[18] Its affordances implicitly encouraged repetition, review, and application, aligning with usage-based models of language learning, which emphasize frequency and contextual diversity as drivers of lexical development. The observational data thus substantiate the interview findings and confirm that perceived benefits were realized in observable classroom performance.

Taken together, the sequential analysis of Tables 1 and 2 reveals a coherent mechanism of vocabulary retention mediated by Google Sites. Interview data demonstrate learners' cognitive engagement, reduced cognitive load, and emerging autonomy, while observational data confirm the productive activation and automatization of retained vocabulary.[19] The convergence of perceptual and behavioral evidence strengthens the argument that vocabulary retention was not incidental, but systematically supported through multimodal encoding, contextualized processing, autonomous retrieval, and repeated use.[20]

Accordingly, Google Sites should be conceptualized not merely as an instructional supplement, but as a multimodal lexical learning infrastructure that aligns with core principles of cognitive efficiency, depth of processing, and self-regulated learning. Within this framework, Arabic vocabulary learning extends beyond memorization toward durable retention and functional communicative use.

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[15] Muhammad Alfa Choirul Murtadho et al., "*Bridging Communication and Competence: The Communicative Approach in Arabic Language Education as a Guide for Advancing Learner Interaction and Proficiency*," Alsuna: Journal of Arabic and English Language 8, no. 2 (2025): 359–73. DOI: https://doi.org/10.31538/alsuna.v8i2.7556

[16] Nick C Ellis, "*At the Interface: Dynamic Interactions of Explicit and Implicit Language Knowledge*," Studies in Second Language Acquisition 27, no. 2 (2005): 305–52. DOI: https://doi.org/10.1017/S027226310505014X

[17] Katherine R Gordon, "*The Advantages of Retrieval-Based and Spaced Practice: Implications for Word Learning in Clinical and Educational Contexts*," Language, Speech, and Hearing Services in Schools 51, no. 4 (2020): 955–65. DOI: https://doi.org/10.1044/2020_LSHSS-19i-00001

[18] Crina Damşa, Monika Nerland, and Zacharias E Andreadakis, "*An Ecological Perspective on Learner-constructed Learning Spaces*," British Journal of Educational Technology 50, no. 5 (2019): 2075–89. DOI: https://doi.org/10.1111/bjet.12855

[19] Raghunath Vedantham, "*The Influence of Data-Driven Learning on Learner Autonomy and Vocabulary Acquisition*," Research Studies in English Language Teaching and Learning 3, no. 2 (2025): 398–410. DOI: https://doi.org/10.62583/rseltl.v3i2.83

[20] Muhammad Alfa Choirul Murtadho and Mirwan Akhmad Taufiq, "*Linguistic Landscape of Pesantren Modern Al-Amanah Junwangi: Its Role in Arabic Acquisition*," JALIE: Journal of Applied Linguistics and Islamic Education 9, no. 2 (2025): 189–212. DOI: https://doi.org/10.33754/jalie.v9i2.1461

B. Affective and Cognitive Engagement

This subchapter examines learners' motivation and engagement following the integration of Google Sites into Arabic vocabulary instruction. Drawing on interview data (Table 3), the discussion elucidates how technological affordances translated into affective, cognitive, and behavioral engagement, thereby complementing the vocabulary retention mechanisms discussed in the previous section.

Table 3. Interview Excerpts on Motivation and Engagement

No	Informan	Description
1	Teacher	"Students appear more enthusiastic when quizzes are delivered via Google Sites."
2	Student A	"I study longer because the display is attractive."
3	Student B	"The tasks are not boring like memorization."
4	Student C	"Writing practice feels easier after reading example sentences."
5	Student D	"I prefer studying from my phone rather than thick books."

Table 3 presents interview excerpts from teachers and students that consistently indicate heightened motivation and sustained engagement in vocabulary learning activities mediated by Google Sites. Teachers reported increased enthusiasm during digitally delivered quizzes, while students emphasized longer study duration, reduced boredom, and greater preference for mobile-based learning. The convergence of these responses across informants suggests that Google Sites functioned as a catalyst for learning participation rather than a neutral delivery medium.[21]

From an engagement perspective, the increased enthusiasm toward quizzes reflects the role of task-driven interactivity and immediate feedback, which are central principles of engagement theory. Digital quizzes embedded in Google Sites introduced elements of challenge, goal orientation, and rapid response, thereby sustaining learners' attention and participation. Such conditions align with the notion that engagement is strengthened when learners perceive tasks as purposeful, manageable, and responsive.[22]

Student narratives further indicate that interface aesthetics and navigational clarity significantly influenced learning behavior. The perception that an "attractive layout" encouraged longer study sessions reflects enhanced sustained attention, a key cognitive prerequisite for effective vocabulary acquisition. From a cognitive-affective standpoint, visually coherent design reduces perceptual fatigue and supports prolonged engagement, enabling learners to remain cognitively invested in learning tasks.

The preference for mobile-based learning expressed by students underscores the relevance of Mobile-Assisted Language Learning (MALL) frameworks. Familiarity with personal devices lowered affective barriers and increased learning comfort, thereby fostering positive emotional engagement. Rather than introducing additional cognitive demands, Google Sites aligned with learners' everyday digital practices, allowing motivation to emerge organically from usability and accessibility.

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[21] Annisa Hanin Larenzi et al., "*Development of Quizlet Platform-Based Learning Media for Middle School Students' Understanding of Arabic Vocabulary*," Mantiqu Tayr: Journal of Arabic Language 4, no. 2 (2024): 382–402. DOI: https://doi.org/10.25217/mantiqutayr.v4i2.4256

[22] Hasan Alisoy and Zarifa Sadiqzade, "*Mobile-Assisted Language Learning (MALL): Revolutionizing Language Education*," Luminis Applied Science and Engineering 1, no. 1 (2024): 60–72. DOI: https://doi.org/10.69760/lumin.202400002

Students' explicit contrast between Google Sites–based tasks and traditional memorization practices further indicates a shift from surface-level engagement to task-based and meaning-oriented participation. The characterization of digital tasks as "not boring" signals a reduction in negative affective load, which often constrains vocabulary uptake in conventional instruction. At the same time, the perceived ease of writing after exposure to example sentences demonstrates that engagement operated simultaneously at affective and cognitive levels. Multimodal input not only increased interest but also directly facilitated language production, reinforcing learners' sense of competence.[23]

These findings resonate with theoretical positions that conceptualize motivation as a central determinant of lexical acquisition. Motivated learners are more likely to engage in repeated exposure, voluntary practice, and autonomous retrieval, all of which are critical for durable vocabulary learning.[24] The interview data suggest that Google Sites created an ecological condition that supported such behaviors by combining interactivity, visual quality, and flexible access.

Importantly, motivation in this context did not function merely as an emotional response but as a behavioral regulator that sustained engagement over time. Increased study duration, preference for digital tasks, and willingness to engage with writing activities indicate that motivation translated into observable learning behavior. This supports the argument that well-designed digital environments can transform motivation into sustained cognitive investment rather than transient enthusiasm.

In sum, Table 3 demonstrates that Google Sites enhanced learner motivation and engagement through task-driven interactivity, aesthetic coherence, and digital accessibility. These factors jointly reduced affective barriers, sustained attention, and facilitated meaningful participation in vocabulary learning. When situated alongside the retention findings discussed earlier, motivation emerges as a reinforcing mechanism that amplified learners' willingness to engage in autonomous, repetitive, and productive lexical practice.[25]

Accordingly, Google Sites should be understood not only as a tool for vocabulary retention but also as an engagement-oriented learning ecology that integrates affective and cognitive dimensions of language learning. By aligning technological design with learners' motivational and digital preferences, the platform supported sustained participation and contributed indirectly to more effective and enduring vocabulary acquisition.

C. From Rote Memorization to Meaning-Oriented Processing

Data analysis revealed a fundamental contrast between Google Sites–based vocabulary learning and conventional rote memorization methods. Student narratives indicated that traditional approaches were perceived as mechanical, characterized by short-lived retention and a lack of communicative usage cues. In contrast, Google Sites provided a cognitively richer, more structured, multimodal, and function-oriented learning experience, resulting in more stable processes of lexical internalization.

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[23] Elke Peters and Carmen Muñoz, "*Introduction to Special Issue Language Learning from Multimodal Input*," Studies in Second Language Acquisition 42, no. 3 (2020): 489–97. DOI: https://doi.org/10.1016/j.system.2016.04.001

[24] Norbert Schmitt, "*Instructed Second Language Vocabulary Learning*," Language Teaching Research 12, no. 3 (2008): 329–63. DOI: https://doi.org/10.1177/1362168808089921

[25] Muhammad Alfa Choirul Murtadho et al., "*Breaking Language Barriers: Amplifying Arabic Proficiency in Bilingual Environment through Immersive Learning*," Insyirah: Jurnal Ilmu Bahasa Arab dan Studi Islam 8, no. 1 (2025): 153–71. DOI: https://doi.org/10.26555/insyirah.v8i1.13175

Table 4. Student Narratives Comparing the Two Methods

No	Informan	Description
1	Student A	"Rote memorization is quickly forgotten, but when I see the sentences I understand."
2	Student B	"With vocabulary lists, I only remember for a short time."
3	Student C	"Google Sites makes me remember longer."
4	Student D	"The old method was only writing on the board, but Google Sites has pictures and examples."
5	Teacher	"Students' retention is more stable with Google Sites; this is evident in weekly tests."

Table 4 presents interview excerpts that consistently reveal a sharp contrast between the two approaches. Students described conventional rote memorization as mechanical, short-lived, and detached from communicative usage. Vocabulary lists written on the board were perceived as encouraging temporary recall without providing semantic or pragmatic cues necessary for durable learning. Teachers' observations further corroborated these perceptions, noting that retention under conventional methods was unstable and difficult to sustain across instructional cycles.[26]

These accounts highlight a central weakness of rote memorization that has long been identified in Second Language Acquisition research: its reliance on surface-level repetition without semantic anchoring.[27] Students' statements that vocabulary learned through lists was "quickly forgotten" indicate shallow cognitive processing, where lexical items are encoded without meaningful integration into existing knowledge networks. As argued by Hulstijn and Schmitt, such practices fail to activate associative semantic and situational links, resulting in fragile memory traces that decay rapidly.

In contrast, Google Sites–based learning was consistently described as facilitating longer retention and deeper understanding. The integration of example sentences, visual illustrations, and audio pronunciation enabled learners to encounter vocabulary in meaningful, multimodal contexts. From a cognitive perspective, this design promoted elaborative encoding by engaging semantic, phonological, and contextual dimensions simultaneously. Student claims that they "remember longer" provide qualitative evidence of this deeper processing mechanism at work.[28]

Moreover, Google Sites enabled distributed repetition through repeated, self-directed access, a feature absent in conventional board-based instruction. This pattern aligns with spaced retrieval theory, which posits that memory consolidation is strengthened when retrieval occurs repeatedly over time rather than in massed sessions.[29] The platform's accessibility allowed learners to revisit

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[26] Ahmad Nahidl Silmy et al., "*Urgensi Metode Belajar dalam Pembelajaran Bahasa Arab (Bagi Penutur Non-Arab)*," Mantiqu Tayr: Journal of Arabic Language 4, no. 2 (2024): 368–81. DOI: https://doi.org/10.25217/mantiqutayr.v4i2.4423

[27] Fatima Mammadova, "*Memorization Strategy and Foreign Language Learnings: A Narrative Review*," Journal of Azerbaijan Language and Education Studies 2, no. 3 (2025): 57–68. DOI: https://doi.org/10.69760/jales.2025002014

[28] Yusfar Ramadhan et al., "*Taṭbīqu An-Nāmudzaji Al-Istifsari 'Ala Asasi At-Tiknulujiya Fi Dirasati Al-Imla' Ladāy At-Thullābi Bil MustawāAl-Tsani Bijami 'aty Al-Amien Al-Islamiyah Prenduan*," Mantiqu Tayr: Journal of Arabic Language 4, no. 1 (2024): 196–212. DOI: https://doi.org/10.25217/mantiqutayr.v4i1.3961

[29] Kamal Heidari, "*The Impact of Spaced and Massed Practice on Deliberate Learning of English Opaque Idioms across L2 Proficiency Levels: A Mixed-Methods Research*" (Open Access Te Herenga Waka-Victoria University of Wellington, 2024): 21. DOI: https://doi.org/10.26686/wgtn.27080959

vocabulary beyond classroom constraints, thereby reinforcing memory pathways through sustained activation.

Teachers' observations of more stable performance in weekly assessments further validate the superiority of the Google Sites approach. The ability to maintain vocabulary knowledge across instructional intervals indicates successful consolidation into long-term memory.[30] In contrast, conventional methods, limited to static word lists and transcription, did not provide sufficient processing depth or retrieval opportunities to support durable retention.

From the standpoint of the depth-of-processing hypothesis, this disparity is theoretically expected. Rote memorization primarily engages shallow processing focused on form-level repetition, whereas Google Sites–based learning facilitates deeper processing through meaning construction, contextual application, and multimodal reinforcement. The quality of processing, rather than the quantity of exposure alone, accounts for the marked difference in retention outcomes observed between the two methods.

Taken together, the comparative analysis demonstrates that Google Sites–based vocabulary learning offers a cognitively richer and pedagogically more effective alternative to conventional rote memorization. By enabling multimodal encoding, contextualized exposure, and distributed retrieval, the platform supports stable lexical internalization and functional language use. Conventional methods, by contrast, remain constrained by their reliance on surface-level repetition and limited cognitive engagement.

Accordingly, the findings suggest that the effectiveness of vocabulary instruction is determined less by the act of memorization itself than by the cognitive ecology within which memorization occurs. Google Sites transforms vocabulary learning from a mechanical exercise into a meaning-oriented, cognitively grounded process, thereby accounting for its superior retention outcomes in Arabic language learning contexts.

D. Pedagogical Mediation under Contextual Constraints

The implementation of Google Sites in vocabulary instruction encountered substantial operational and pedagogical constraints. Nevertheless, teachers' adaptive responses ensured that learning remained effective and aligned with instructional objectives. Field data indicate that each obstacle was addressed through consciously designed mediation strategies intended to preserve accessibility, continuity, and depth of lexical processing.

Table 5. Observations on Challenges and Adaptive Strategies

No	Challenge	Descrption	Strategy
1	Internet access	Students could only access materials while at school	Teachers provided offline versions of the content
2	Digital literacy	Beginner learners had difficulty navigating the platform	Structured tutorials and guided independent practice
3	Abstract vocabulary	Students struggled to understand non-concrete words	Additional example sentences and explanatory audio
4	Limited devices	Four STudets shared one device	Small-group organization

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[30] Muhammad Alfa Choirul Murtadho, "تناوب حروف الجر في القرآن الكريم: أنماطه ودلالاته" in Proceedings of International Conference on Islamic Civilization and Humanities, vol. 3 (2025): 106–24. DOI: https://doi.org/10.33754/jalie.v9i2.1461

| 5 | Class time | Limited time for individual exploration | Independent exploration tasks assigned in the dormitory |

Table 5 summarizes five major challenges related to infrastructure, learner readiness, instructional content, and classroom organization. Limited internet access emerged as a structural constraint typical of pesantren-based educational contexts, restricting students' ability to access digital materials beyond the school environment. Teachers responded by providing offline versions of the content, thereby preserving continuity of exposure and preventing disruptions in vocabulary learning cycles.[31]

From a theoretical perspective, this strategy highlights the teacher's role as a technology broker, mediating between technological affordances and contextual realities.[32] As argued in Computer-Assisted Language Learning literature, the pedagogical value of technology is contingent not on its availability, but on how it is integrated and adapted to local conditions. The findings resonate with arguments that technology becomes effective only through informed instructional design and contextual sensitivity.[33]

Challenges related to digital literacy revealed an entry threshold for novice learners unfamiliar with structured online platforms. Teachers addressed this barrier through structured tutorials and guided independent practice. These interventions functioned as instructional scaffolding, gradually transferring operational responsibility from teacher to learner. Beyond enhancing technical competence, scaffolding supported learners' confidence and willingness to engage with digital materials, thereby reinforcing motivational dimensions of learning.[34]

From a socio-cognitive standpoint, such scaffolding aligns with the principle that effective learning environments must balance cognitive challenge with adequate support.[35] By sequencing guidance and gradually reducing assistance, teachers ensured that digital engagement did not become a source of cognitive overload or frustration.

Abstract vocabulary posed a pedagogical challenge due to its limited perceptual referents. Teachers responded by enriching lexical input through additional example sentences and explanatory audio. This strategy enhanced semantic and pragmatic elaboration, enabling learners to construct meaning beyond literal translation. In accordance with Depth of Processing Theory, deeper semantic engagement and contextual linkage resulted in stronger and more durable memory traces.[36]

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[31] Mark Warschauer, "*Researching Technology in TESOL: Determinist, Instrumental, and Critical Approaches*," TESOL Quarterly 32, no. 4 (1998): 757–61. DOI: https://doi.org/10.2307/3588010

[32] Anwar Ahmed, "*Affective Affordances in Technology-Mediated Language Teaching and Learning*," Technology in Language Teaching & Learning 6, no. 4 (2024): 1720. DOI: https://doi.org/10.29140/tltl.v6n4.1720

[33] Rosemary Luckin, *Re-Designing Learning Contexts: Technology-Rich, Learner-Centred Ecologies* (Routledge, 2010). DOI: https://doi.org/10.4324/9780203854754

[34] Kathryn Coleman and Arianne Rourke, "*A Learner Support System: Scaffolding to Enhance Digital Learning*," International Journal of Technology, Knowledge and Society 6, no. 1 (2010): 55. DOI: https://doi.org/10.18848/1832-3669/CGP/v06i01/56067

[35] Hafiz Abdul Sami and Muhammad Ahsan Raza, "*Implications of Task-Based Learning and Cognitive Theory on Language Learning*," Journal of Applied Linguistics and TESOL (JALT) 8, no. 2 (2025): 1446–59. DOI: https://doi.org/10.63878/jalt797

[36] Fergus I M Craik, "*Levels of Processing: Past, Present... and Future?*," Memory 10, no. 5–6 (2002): 305–18. DOI: https://doi.org/10.1080/09658210244000135

The multimodal treatment of abstract vocabulary also aligned with cognitive theories emphasizing the role of elaboration in lexical acquisition.[37] By engaging multiple representational channels, teachers transformed abstract lexical items into cognitively accessible constructs, thereby facilitating retention and communicative transfer.

Constraints related to limited devices and class time foregrounded organizational dimensions of technology integration. Small-group learning arrangements were implemented to address device scarcity, operationalizing principles of collaborative engagement. Interaction within small groups facilitated peer support and meaning negotiation, processes widely recognized as beneficial for language development.

To compensate for limited classroom time, teachers assigned independent exploration tasks in dormitory settings. This extension of learning beyond the classroom represents a form of distributed learning, where exposure and retrieval are spread across contexts and time. Such practices are consistent with contemporary models of language learning that emphasize continuity and learner agency.

Overall, the adaptive strategies observed reinforce a central argument within Computer-Assisted Language Learning research: technology does not guarantee pedagogical effectiveness in isolation. Rather, instructional success depends on teachers' capacity to mediate, scaffold, and reorganize learning environments in response to contextual constraints. In this study, teachers' adaptive interventions preserved accessibility, sustained cognitive engagement, and maintained depth of lexical processing despite infrastructural and organizational limitations.

Accordingly, the findings underscore the centrality of teacher-mediated adaptation as the decisive factor in the successful implementation of digital vocabulary instruction. Google Sites functioned effectively not as an autonomous solution, but as a pedagogical resource whose potential was realized through reflective and context-sensitive instructional strategies.

Closing

This study confirms that Google Sites functions as an effective digital medium for strengthening Arabic vocabulary mastery among non-native learners through a structured, multimodal, and accessibility-oriented instructional design. Compared to conventional memorization-based methods, Google Sites facilitated deeper lexical processing by integrating semantic, phonological, and contextual elaboration, resulting in more stable vocabulary retention and a measurable shift from receptive to productive lexical knowledge. The findings reinforce prior research on digital vocabulary learning while extending the state of the art by demonstrating that low-cost, non-complex platforms can generate significant pedagogical impact when supported by purposeful instructional design. Theoretically, this study contributes to the integration of depth of processing, dual coding, and self-regulated learning within Arabic vocabulary instruction. Practically, it offers a replicable and context-sensitive instructional model for pesantren and secondary school environments, thereby strengthening the role of lightweight digital technologies within the broader framework of Computer-Assisted Language Learning (CALL).

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