

Vocabulary Learning Strategies in Second Language Acquisition: A Critical Synthesis of Theory, Research, and Pedagogical Implications

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Abstract: The acquisition of vocabulary occupies a central position in second language acquisition (SLA), as lexical knowledge underpins communicative competence across all four language skills. Despite this recognition, vocabulary learning strategies (VLS) remain an area where pedagogical practice has often lagged behind theoretical understanding. This critical review synthesizes empirical research and theoretical perspectives on VLS within SLA, drawing upon a purposive corpus of six scholarly works that collectively span questions of strategy taxonomy, individual learner differences, contextual influences, technology integration, and the instructor-learner belief gap. The review is organized around a person-task-context-strategy tetrahedral model that positions vocabulary acquisition as a dynamic, interactional process rather than a discrete cognitive event. Findings indicate that no single strategy constitutes an optimal solution for all learners; rather, the effectiveness of any given strategy is contingent upon the learner's proficiency level, motivational orientation, metalinguistic awareness, cultural background, and the specific demands of the learning task. Metacognitive and cognitive strategies consistently emerge as the most frequently employed by effective learners, while affective and social strategies remain systematically underutilized. The review further establishes that technology-enhanced vocabulary learning offers substantive gains, particularly when digital tools are employed with pedagogical intentionality and explicit instruction. Critical analysis reveals persistent methodological limitations in existing research, including overreliance on self-report questionnaires, limited longitudinal designs, and insufficient attention to contextual variables. Pedagogical implications are offered for instructors seeking to bridge the gap between strategy theory and classroom practice. The review concludes by identifying priority areas for future empirical investigation, including the effectiveness of strategy instruction models, the role of learner autonomy in digital learning environments, and the interplay between cultural learning traditions and strategy preference.

Keywords: vocabulary learning strategies, second language acquisition, learner autonomy, metacognitive strategies, technology-enhanced learning, individual differences, strategy training

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INTRODUCTION

Vocabulary knowledge is the foundational bedrock of language competence. As Wilkins (1972) profoundly asserted, while little can be communicated without grammar, nothing can be communicated without vocabulary. Despite this foundational status, vocabulary instruction historically occupied a marginalized position in second language pedagogy for several decades, largely displaced by the communicative turn's emphasis on grammatical form and discourse structure (Yar & Shaheedzooy, 2023; Zimmerman & Schunk, 2021). It is only in recent decades that vocabulary acquisition has reasserted itself as a primary focus of both theoretical inquiry and applied research in the field of applied linguistics.

The study of vocabulary learning strategies (VLS) emerged as a dedicated subfield within the broader investigation of language learning strategies (LLS) during the 1970s and 1980s. This emergence was driven by a paradigm shift from purely pedagogical methodologies to a cognitive focus on the learner, specifically the desire to understand how successful learners differ from their less successful counterparts (Rivera-Mills & Plonsky, 2007). Early researchers, including Rubin (1975) and Stern (1975), sought to identify the behavioral and cognitive characteristics that distinguished "good language learners." Their pioneering observational studies laid the empirical groundwork for subsequent, more rigorous taxonomy-building efforts by scholars such as O'Malley & Chamot (1990), Oxford (1990), and (Schmitt, 1997). These foundational taxonomies—encompassing cognitive, metacognitive, memory, compensatory, social, and affective strategy categories—provided researchers and educators with an analytical scaffolding through which to investigate learners' self-regulatory behaviors during the complex process of vocabulary acquisition.

What has become increasingly clear from decades of accumulated empirical evidence is that vocabulary learning is not a simple, uniform process reducible to rote memorization or contextual guessing. Rather, it is a highly complex, multidimensional enterprise whose success depends upon the dynamic interaction of a multitude of variables. These include learner characteristics (e.g., proficiency, motivation, learning style, cultural background), task demands (e.g., breadth versus depth of vocabulary knowledge, receptive versus productive tasks), and contextual factors (e.g., English as a Foreign Language [EFL] vs. English as a Second Language [ESL] environments, cultural learning traditions, access to technology (Gu, 2003; Mehrabian & Salehi, 2019). Recognizing this complexity is a prerequisite to developing pedagogical approaches that are genuinely responsive to the diversity of learner needs in contemporary globalized classrooms.

Despite the proliferation of VLS research, significant gaps persist between theoretical findings and actual classroom implementation. Instructors frequently remain unaware of the strategic profiles of their students, and learners often employ strategies that are misaligned with optimal second language acquisition (SLA) principles. Furthermore, the advent of digital learning environments has introduced new variables that traditional VLS taxonomies are only beginning to accommodate. Therefore, a critical synthesis of existing literature is required to bridge these gaps.

The present review addresses three overarching research questions:

1. What taxonomies of vocabulary learning strategies have been proposed, and which strategies are most frequently employed by successful L2 learners?
2. What individual, contextual, and instructional factors moderate the effectiveness of vocabulary learning strategies?

3. What are the pedagogical implications of the existing evidence base for vocabulary instruction in second and foreign language classrooms?

In pursuing these questions, the review draws upon a carefully selected corpus of six scholarly works, each contributing a distinct analytical perspective: Gu (2003) on the person-task-context-strategy tetrahedral model; Rivera-Mills & Plonsky (2007) on learner autonomy, strategy training, and metalinguistic awareness; Sulistiyo (2018) on learner characteristics and contextual factors in EFL environments; Mehrabian & Salehi (2019) on diverse VLS and word mastery; Ghafar & Mohamedamin (2022) on VLS taxonomy and the intentional-incidental learning dichotomy; and Dionisio et al. (2022) on VLS and technology integration. The review proceeds by first outlining the methodological framework, followed by a thematic synthesis structured around these core dimensions, culminating in an integrative discussion, pedagogical implications, and directions for future research.

RESEARCH METHOD

Review Design

This review adopted a structured narrative review design to synthesize major theoretical and empirical contributions on vocabulary learning strategies (VLS) in second language acquisition (SLA). Given that the manuscript aims to critically integrate theory, empirical findings, contextual moderators, and pedagogical implications, a structured review approach was considered more appropriate than a purely systematic review or meta-analysis. This choice was made because a structured narrative approach allows for the conceptual depth and theoretical nuance required to synthesize complex constructs (such as cultural beliefs and metacognitive awareness) while maintaining methodological transparency. The review was guided by principles of systematic literature identification, explicit selection criteria, analytical categorization, and thematic synthesis. The objective was not merely to summarize previous studies descriptively, but to critically examine how major strands of VLS scholarship converge, diverge, and interact around learner characteristics, task demands, contextual influences, strategy taxonomies, technology integration, and instructional implications.

Literature Search Strategy and Timeline

A focused, rigorous search was conducted to identify relevant literature. To ensure both historical depth and contemporary relevance, the search was restricted to a specific timeline: January 1990 to December 2023. This timeframe was selected because it captures the seminal taxonomy-building era of the 1990s (Oxford, 1990; Schmitt, 1997) while also encompassing the most recent advancements in digital vocabulary learning.

The search was executed between March 2023 and May 2023. Access to major academic databases was obtained through the institutional proxy servers of Uruzgan University and Nimruz University, Afghanistan, providing full-text access to peer-reviewed content. The databases systematically searched included:

- a. Scopus (Elsevier)
- b. Web of Science (Clarivate Analytics)
- c. ERIC (Education Resources Information Center)
- d. Google Scholar (used as a supplementary tool to capture grey literature and highly cited open-access works)
- e. ScienceDirect (Elsevier)

The search process targeted peer-reviewed journal articles, foundational books, edited volumes, and influential review papers. The following Boolean keyword combinations were used across all databases:

- a. ("vocabulary learning strategies" OR "VLS") AND ("second language acquisition" OR "SLA")
- b. ("lexical learning strategies" OR "vocabulary acquisition techniques") AND ("EFL" OR "ESL")
- c. "Metacognitive strategies" AND "vocabulary learning"
- d. "Technology-enhanced" AND "vocabulary acquisition."
- e. "Learner autonomy" AND "vocabulary strategies"
- f. "Strategy training" AND "L2 vocabulary"

Inclusion and Exclusion Criteria

To ensure the quality and relevance of the synthesis, strict inclusion and exclusion criteria were established before the search.

Inclusion Criteria:

- a. Direct relevance to vocabulary learning strategies in SLA, ESL, or EFL contexts.
- b. Strong theoretical, empirical, or pedagogical contribution to the field.
- c. Publication in peer-reviewed journals, scholarly books, or reputable edited volumes.
- d. Explicit discussion of at least one of the following: strategy taxonomies, learner variables (proficiency, motivation, gender), contextual moderators (culture, environment), or instructional/technological applications.
- e. Sufficient methodological clarity and scholarly citation impact (prioritizing widely cited foundational texts and rigorous empirical studies).
- f. Published in the English language.

Exclusion Criteria:

- a. Studies focusing exclusively on general language learning without a specific, dedicated vocabulary dimension.
- b. Studies lacking theoretical or empirical rigor (e.g., non-peer-reviewed opinion pieces, unpublished informal materials, blog posts).
- c. Studies that duplicated arguments or findings already represented by stronger, more comprehensive sources.
- d. Studies focusing solely on first language (L1) vocabulary acquisition or clinical speech-language pathology without SLA implications.

Study Selection, Duplicate Checking, and Transparency

The initial database search yielded a total of 485 records. These records were exported to the EndNote X9 reference management software. Duplicate checking was the first critical step in ensuring selection transparency. Using EndNote's automated duplicate detection function, followed by manual verification by the researchers, 142 exact and near-exact duplicates were removed, resulting in 343 unique records.

The screening process was conducted by two independent reviewers (the first and second authors) to minimize selection bias. In the first phase (title and abstract screening), the reviewers independently evaluated the 343 records against the inclusion/exclusion criteria. Records that clearly did not meet the criteria (e.g., purely medical studies using the term "vocabulary," or L1 reading studies) were excluded. Inter-rater reliability at this stage was calculated using Cohen's Kappa, yielding a coefficient of 0.84, indicating strong agreement. Discrepancies at this stage (n=18) were resolved through discussion with a third reviewer (the third author).

Following title and abstract screening, 68 full-text articles were retrieved for in-depth evaluation. During the full-text review, it became apparent that conducting a traditional systematic review aggregating dozens of studies would result in a superficial descriptive summary, inadequate for addressing the complex, theoretically driven research questions of this study. Therefore, the reviewers shifted to a purposive sampling strategy. Instead of including all 68 studies, the reviewers applied a "critical theoretical saturation" criterion, selecting studies that offered the most profound theoretical frameworks, the most comprehensive taxonomic reviews, and the most rigorous empirical findings relevant to the intersection of person, task, context, and strategy.

Through this rigorous, transparent selection process, six core scholarly works were purposively selected as the principal analytical corpus. These studies were chosen precisely because they collectively represented the most relevant, high-impact dimensions of the review questions: Gu (2003), Sulistiyo (2018), Mehrabian & Salehi (2019), Ghafar & Mohamedamin (2022), and Dionisio et al. (2022). The remaining literature from the initial search (over 20 additional references) was utilized not as core corpus members but as supplementary literature to support specific claims, provide historical context, and enrich the theoretical discussion within the text.

Analytical Framework and Synthesis Procedure

The synthesis process followed a thematic and theory-driven analytical procedure. First, each of the six selected core sources was read multiple times to identify its core constructs, methodological orientation, and pedagogical claims. Second, findings were deductively and inductively coded into recurring themes, including: definitional dimensions of vocabulary knowledge, intentional vs. incidental learning, VLS taxonomies, learner proficiency, motivation, contextual/cultural factors, digital vocabulary learning, and strategy training. These themes were then interpreted through Gu's (2003) person-task-context-strategy tetrahedral model, which served as the overarching theoretical lens. To enhance scholarly rigor and trustworthiness, the review employed source triangulation across theoretical and empirical studies, conceptual cross-validation of recurring claims, and critical comparison of convergent and divergent findings.

RESULT AND DISCUSSION

Vocabulary Acquisition as a Multidimensional Construct

Receptive vs. Productive Dimensions: Vocabulary, understood most broadly, encompasses both the words a language user can recognize and interpret (receptive vocabulary) and those they can actively deploy in speech and writing (productive vocabulary) (Ghafar & Mohamedamin, 2022). These two dimensions—which Ghafar & Mohamedamin (2022) align with the distinction between passive and active knowledge—are not discrete binary states but exist on a fluid continuum. Inevitably, receptive competence typically exceeds productive mastery by a substantial margin. A learner may recognize hundreds of words in a reading passage but struggle to use those same words spontaneously in writing or speech. This distinction is highly consequential for VLS selection: strategies employed to expand receptive breadth (e.g., extensive reading with minimal dictionary use) differ fundamentally from those required to develop productive depth (e.g., forced-output tasks, rehearsed sentence generation).

Breadth vs. Depth of Knowledge: (Nation, 2013) further complicates the construct by distinguishing between the *breadth* of vocabulary knowledge (the number of word families

known) and the *depth* (the richness and precision of knowledge about individual words). Depth encompasses a word's morphological properties, syntactic behavior, collocational frequencies, semantic prosody, and pragmatic appropriateness. This distinction directly impacts strategic decision-making. Breadth acquisition may be efficiently served by direct vocabulary instruction, spaced repetition systems (SRS), and word-list learning. Conversely, depth development generally requires sustained, deep engagement with words in varied authentic contexts—strategies that demand significantly more cognitive resources and time (Gu, 2003; Mehrabian & Salehi, 2019).

Furthermore, vocabulary acquisition in a second language is fundamentally distinguished from first-language (L1) acquisition by the learner's point of departure. L1 learners acquire vocabulary largely through implicit, incidental exposure during the course of naturalistic communicative interaction, a process requiring neither deliberate attention nor explicit instruction (Gu, 2003; Nation, 2013). L2 learners, particularly those in foreign language (EFL) contexts where target language input is severely limited to formal instructional settings, cannot rely upon the same naturalistic mechanisms. They must instead employ deliberate, strategic behaviors to compensate for reduced exposure—a fundamental difference that foregrounds the paramount importance of VLS in SLA (Dionisio et al., 2022; Ghafar & Mohamedamin, 2022).

The Incidental-Intentional Learning Dichotomy

The Mechanics of Incidental Acquisition: One of the most enduring debates in vocabulary acquisition research concerns the relative merits of incidental versus intentional vocabulary learning. Incidental learning refers to vocabulary acquired as a natural byproduct of engagement with meaningful language—reading, listening, or communicative interaction—without any deliberate, explicit effort to memorize the words encountered. Proponents of incidental learning, heavily influenced by Krashen's Input Hypothesis, argue that providing comprehensible input in low-anxiety environments is sufficient for lexical development. Research reviewed by Gu (2003) supports this to an extent; studies by Saragi et al. (1978), Pitt et al. (1989), and Day et al. (1991) all provide evidence that sustained silent reading leads to measurable incidental vocabulary acquisition.

However, the L2 literature reveals severe limitations to pure incidental learning. The gains observed in L2 contexts are consistently lower than those reported for L1 learners. Crucially, evidence strongly suggests that learners below the intermediate proficiency threshold are particularly poorly positioned to benefit from incidental exposure. Effective contextual guessing requires a pre-existing vocabulary threshold (often cited as 95% to 98% lexical coverage of a text, as established by Laufer, 1992; Nation, 2006) that beginners have simply not yet attained (Gu, 2003; Nation, 1990). Without this baseline, contextual guessing devolves into mere random guessing, yielding negligible retention.

The Role of Intentional Learning: Intentional learning, by contrast, involves conscious, goal-directed effort to acquire specific lexical items, as seen in the study of word lists, vocabulary cards (e.g., flashcards), or targeted dictionary use (Ghafar & Mohamedamin, 2022; Karami & Bowles, 2019). While historically criticized as "rote learning," intentional strategies have been vindicated by cognitive science research demonstrating the power of spaced repetition and retrieval practice for long-term memory consolidation (Baddeley, 1997). For beginner L2 learners, intentional strategies are not merely helpful; they are a pragmatic necessity for

bootstrapping initial lexical knowledge to the threshold required for incidental learning to become viable.

Blurring the Boundaries: The binary opposition between incidental and intentional learning has rightfully been challenged by contemporary scholars. Ghafar & Mohamedamin (2022) and Gu (2003) both note that in authentic learning situations, the two modes are not mutually exclusive but highly synergistic. A learner who encounters an unfamiliar word while reading (an incidental context) may spontaneously engage in intentional behaviors—dictionary look-up, note-taking, generating an original sentence, and deliberate repetition—thereby converting an incidental encounter into a deliberate, intentional learning event. Meganathan & others (2019), cited in Ghafar & Mohamedamin (2022), found empirically that a combined incidental and intentional approach yielded superior vocabulary outcomes compared to either approach in isolation. This finding is perfectly consistent with Gu's (2003) tetrahedral model, which emphasizes strategy combinations and task-context interactions rather than simplistic single-strategy solutions.

Taxonomies and Classifications of Vocabulary Learning Strategies

General LLS Frameworks Applied to Vocabulary: The systematic classification of VLS has been one of the most productive, yet contested, areas within SLA research. Oxford's (1990) taxonomic framework, widely regarded as the most comprehensive classification of LLS to date (Ellis, 1994; Mehrabian & Salehi, 2019), partitions strategies into two primary macro-categories: direct strategies (memory, cognitive, and compensatory) and indirect strategies (metacognitive, affective, and social). Within the vocabulary domain, memory strategies encompass mnemonics, imagery, keyword techniques, and grouping; cognitive strategies include repetition, dictionary use, note-taking, and translation; while metacognitive strategies involve the higher-order executive functions of planning, monitoring, and evaluating one's own learning process (Oxford, 1990; Rivera-Mills & Plonsky, 2007). While highly influential, Oxford's taxonomy has been critiqued for occasionally blurry boundaries between subcategories (e.g., distinguishing memory from cognitive strategies) and for being developed primarily with Western learner populations in mind.

Vocabulary-Specific Classifications: Recognizing the limitations of general LLS taxonomies, Schmitt (1997) developed a framework specifically tailored to the lexical domain. Described extensively in both Ghafar & Mohamedamin (2022) and Gu (2003), Schmitt's taxonomy is organized around two superordinate categories: *discovery strategies* (used to determine the meaning of an unknown word) and *consolidation strategies* (used to retain words once their meanings are known). Within discovery strategies, Schmitt (1997) astutely distinguishes *determination strategies* (employed when learners work independently, such as analyzing morphology, guessing from context, or consulting a dictionary) from *social strategies* (employed through interaction, such as asking a teacher or peer). Within consolidation strategies, the taxonomy encompasses social, memory, cognitive, and metacognitive subcategories. This two-level, process-oriented structure captures the sequential reality of vocabulary learning much more precisely than taxonomies that treat strategies as static, interchangeable tools.

Other notable taxonomies include Stoffer (1995) model, reviewed in Ghafar & Mohamedamin (2022), which organizes VLS into nine overarching categories comprising 53 distinct tactics—including strategies for using natural language, creative exercises, self-motivation, and stress management. Furthermore, Gu & Johnson (1996) taxonomy provides an

eight-category model covering metacognitive regulation, guessing, dictionary use, note-taking, rehearsal, and encoding. This model has been widely operationalized as a survey instrument in empirical studies across various EFL contexts (Mehrabian & Salehi, 2019).

Critical Evaluation of Taxonomic Proliferation: While the proliferation of taxonomies reflects productive scholarly engagement, it has created severe challenges for cross-study comparability. Researchers using Oxford's SILL cannot easily compare their findings with those using Schmitt's VLSQ or Gu and Johnson's inventory. This fragmentation has fueled ongoing debate about definitional boundaries between individual strategies (Rivera-Mills & Plonsky, 2007). The field is reaching a consensus that future taxonomy development should focus less on creating new discrete lists and more on validating and refining existing integrative models that account for the dynamic, overlapping nature of strategic behavior.

Factors Moderating VLS Use and Effectiveness

The Proficiency-Strategy Interface: The relationship between L2 proficiency and VLS use is one of the most replicated findings in the field. Rivera-Mills & Plonsky (2007) report that Oxford's (2003) review of multiple studies using the Strategy Inventory for Language Learning (SILL) found this relationship to follow either a linear trajectory—whereby proficiency and strategy use increase in tandem—or a curvilinear pattern. In the curvilinear pattern, strategy use increases with proficiency up to an intermediate-advanced point before becoming more automatic and thus less accessible to conscious introspection and self-reporting. (O'Malley et al., 1985) found that intermediate-level ESL students were more likely than beginners to employ metacognitive strategies, reflecting the enhanced metalinguistic awareness and greater cognitive capacity for self-directed learning associated with higher proficiency (Chamot, 1987; Sulistiyo, 2018).

Gu (2003) profoundly observes that it is not merely the quantity of strategy use that changes with proficiency, but the quality. Advanced learners demonstrate more sophisticated deployment of contextual strategies, greater attention to collocational and syntactic information, and more strategic selectivity in determining which words merit deliberate study. These characteristics are associated with what Gu & Johnson (1996) identify as *self-initiation*, *selective attention*, and *deliberate activation*—the three strategy types most consistently predictive of both vocabulary size and general L2 proficiency. Conversely, beginning learners tend toward passive, surface-level strategies, demonstrating what Ahmed (1989) characterizes as a generally passive orientation: ignoring unfamiliar words, refusing dictionary consultation, and treating each word as a discrete, decontextualized item devoid of network connections.

Motivational Orientations and Learner Beliefs

The relationship between motivation and VLS use is bidirectional and mutually reinforcing. Rivera-Mills & Plonsky (2007) draw on Dörnyei (2003) observation that the very act of choosing to employ a learning strategy is, by definition, an expression of motivated behavior. Strategy use and motivation are thus 'inextricably bound together' as antecedents of learner achievement. Learners with higher levels of intrinsic motivation—defined by Noels (2001) as learning driven by self-determined, internally regulated goals—not only employ a larger repertoire of strategies but also report greater perceived usefulness of those strategies, creating a positive feedback loop that sustains strategic engagement over time.

Equally critical are learner beliefs about the nature of language learning, typically measured through (Horwitz, 1985, 1988) Beliefs About Language Learning Inventory (BALLI). Sulistiyo (2018) reports that students who conceptualize language learning primarily as vocabulary memorization will disproportionately allocate time to memorization strategies, while those who understand it as communicative practice will favor social and functional strategies. The danger lies in the fact that these beliefs are often ill-informed, reflecting what Horwitz (1988) calls 'common and sometimes contradictory notions' about SLA. This can lead learners to employ fewer effective strategies despite genuine effort, underscoring the importance of metalinguistic awareness development as a core component of effective language instruction.

Gender and Individual Learner Differences: Gender differences in VLS use represent one of the most frequently investigated individual difference variables, though findings exhibit some contextual variance. Rivera-Mills & Plonsky (2007) report that the most common finding across studies is that female learners employ learning strategies more frequently than males (Green & Oxford, 1995). This includes strategies specifically associated with women's conversational styles, such as rapport-seeking and elicitation of feedback. However, Jiménez Catalán (2003) cited in Rivera-Mills & Plonsky (2007), found that while female learners reported greater overall strategy use, 8 of the 10 most frequently used strategies were shared by both genders, suggesting the existence of 'bedrock strategies'—core strategies employed irrespective of gender or proficiency level.

Mehrabian & Salehi (2019) provide corroborating evidence from Iranian EFL contexts, noting particular gender disparities in memory and affective strategy use. Beyond gender, Gu (2003) notes a constellation of other individual difference variables—learning style preferences (holistic versus analytic), memorization capacity, self-efficacy beliefs, and cognitive style—all of which influence how effectively learners can deploy particular VLS. The practical implication is unequivocal: strategy training programs cannot adopt a one-size-fits-all approach; effective instruction must account for and be responsive to highly individualized learner profiles.

Cultural and Contextual Constraints: Learning context—understood as the socio-cultural, institutional, and physical environment—is the most consistently underexamined variable in VLS research (Gu, 2003). EFL contexts, where target language exposure is largely confined to the formal classroom, impose constraints fundamentally different from ESL contexts, where learners have access to naturalistic input. In EFL contexts, learners are often unable to practice incidental acquisition strategies through everyday communication, making deliberate vocabulary study both more necessary and potentially more burdensome (Ghafar & Mohamedamin, 2022; Sulistiyo, 2018).

Cultural learning traditions exert a profound, often unacknowledged influence. Gu (2003) notes that East Asian learners operating within Confucian-influenced educational traditions may perceive rote memorization not merely as a default pedagogical convention, but as a culturally sanctioned and morally valued form of intellectual effort. This deeply ingrained cultural schema can make the uptake of alternative, inference-based, or communicative strategies challenging, as learners may feel they are not "truly learning" unless they are engaging in repetitive memorization. Sulistiyo (2018) highlights similar structural constraints in Indonesian EFL settings, where large class sizes, limited teaching hours, and an institutional emphasis on grammar-translation methods create systemic barriers to diversified vocabulary instruction. These contextual variables must be attended to by researchers seeking to build ecologically valid models of VLS effectiveness.

Technology-Enhanced Vocabulary Learning

Mobile-Assisted Language Learning (MALL) and Spaced Repetition: One of the most significant paradigm shifts in the vocabulary learning landscape over the past two decades has been the proliferation of digital tools. Dionisio et al. (2022) comprehensively review technology-mediated vocabulary learning studies, concluding that digital tools consistently produce positive effects on vocabulary acquisition, provided they are employed with pedagogical intentionality and appropriate instructional scaffolding.

Among the most extensively studied technologies is Mobile Assisted Language Learning (MALL). Smartphones and tablets allow for ubiquitous, flexible, self-paced vocabulary instruction. Fageeh (2013), cited in Dionisio et al. (2022), found that MALL applications produced significant gains in both vocabulary acquisition and motivational orientation, particularly among adult learners who valued the convenience and portability of mobile devices. Similarly, Dizon (2016) documented statistically significant pre-to-posttest vocabulary gains among Japanese university EFL students who used Quizlet—a digital flashcard and spaced repetition system (SRS)—to study academic vocabulary over ten weeks. The success of such tools is deeply rooted in cognitive psychology; algorithmic spaced repetition precisely targets the "forgetting curve," presenting items for review just as the learner is on the verge of forgetting them, thereby optimizing long-term retention (Baddeley, 1997; Yar & Azimi, 2025).

Gamification and Immersive Environments: Gamification represents another highly promising avenue. Alfadil (2020a), cited in Dionisio et al. (2022), found that students who acquired vocabulary through virtual reality (VR) games outperformed those receiving traditional instruction. The mechanisms underlying these gains are consistent with the depth-of-processing hypothesis (Craik & Lockhart, 1972) the multi-sensory, emotionally engaging, and contextually rich nature of game-based learning promotes the kind of elaborative processing associated with stronger memory encoding and longer retention (Gu, 2003). When a learner interacts with a virtual object, hears its name, and uses it to solve an in-game puzzle, the lexical item is bound to multiple cognitive pathways, increasing the likelihood of durable recall.

Critical Perspectives on Digital Integration: Despite these encouraging findings, Dionisio et al. (2022) rightly caution against uncritical technological determinism. Digital tools are most effective when they incorporate evidence-based pedagogical principles—teaching word-learning strategies, providing authentic and varied contexts for word use, facilitating spaced repetition, and encouraging metacognitive reflection—rather than simply digitizing the rote memorization paradigms they purport to replace. A digital flashcard app used mindlessly is no better than a paper flashcard. Furthermore, the role of the teacher as a facilitator, guide, and monitor of strategy use remains indispensable even in technology-mediated learning environments. Younger learners, in particular, may lack the metacognitive maturity to use digital tools strategically without adult scaffolding, risking off-task behavior or superficial engagement with the technology.

Learner Autonomy and Strategy Training

The Rationale for Explicit Strategy Instruction: Learner autonomy—defined by Oxford (1999) as the self-regulatory practices a student undertakes in managing his or her own learning—represents the overarching pedagogical goal toward which strategy instruction is directed. Rivera-Mills & Plonsky (2007) document the extensive body of empirical research supporting the benefits of strategy-based instruction (SBI), noting that such training consistently

produces gains in strategy awareness, strategy diversity, motivational orientation, and—under the most favorable conditions—actual L2 proficiency. The mechanisms are theoretically grounded: by making previously implicit, automatic learner behaviors explicit and conscious, instruction enables learners to evaluate, modify, and diversify their strategic repertoire in principled ways.

Ghafar & Mohamedamin (2022) argue strongly for what they term "strategy-based instruction" as a pervasive pedagogical orientation rather than a supplemental, isolated classroom activity. In this paradigm, students are systematically introduced to the full range of available VLS, given opportunities to practice them within authentic language tasks, and encouraged to reflect metacognitively on their effectiveness. This approach aligns seamlessly with Zimmerman's (2002) self-regulated learning framework, which posits that learners who manage their behavior strategically—setting goals, selecting strategies, monitoring progress, and self-reflecting—are more likely to achieve academic success than those who rely upon reactive, habit-based behaviors.

Frameworks for Strategy-Based Instruction: Effective strategy instruction generally follows a structured progression, often moving from awareness-raising (helping learners identify what they currently do) to instruction (presenting new strategies), practice (providing controlled then freer tasks for strategy application), and evaluation (guiding learners to assess the efficacy of the strategies used). Weaver and Cohen (1998, cited in Rivera-Mills & Plonsky (2007) emphasize that strategy training must avoid abstract, theoretical explanation in favor of concrete, task-embedded demonstration. Trained learners will ultimately be better learners than untrained ones, but only if the training convinces them of the strategies' practical value in achieving their personal linguistic goals.

The Instructor - Learner Belief Gap

A persistent, formidable challenge to the effectiveness of strategy instruction is the well-documented gap between instructor and student perceptions of effective practice. Rivera-Mills & Plonsky (2007) review extensive evidence demonstrating that L2 instructors are frequently unaware of the idiosyncratic strategies their students actually employ (O'Malley et al., 1985). More critically, when student and teacher beliefs about effective vocabulary learning diverge significantly, the resulting pedagogical mismatch can produce demotivation, frustration, and disengagement (Garrett & Shortall, 2002). This gap is not merely a communication problem but reflects structurally different epistemological frameworks for understanding what constitutes language learning success.

Rivera-Mills & Plonsky (2007) offer a practical, evidence-based recommendation: instructors should administer diagnostic belief surveys (e.g., BALLI) at the outset of courses to map the epistemological frameworks students bring to the classroom. They should then establish ongoing, iterative, dialogic discourse about strategy use throughout the instructional period. This dialogic approach—prioritized over top-down, authoritarian transmission of prescribed strategies—respects learner agency while providing the informational scaffolding learners need to revise ill-informed beliefs and experiment with unfamiliar, potentially more effective strategies. Sulistiyo (2018) reinforces this in the Indonesian EFL context, noting that changing entrenched, passive learning beliefs requires sustained pedagogical intervention, not one-off awareness-raising sessions, and must be supported by institutional assessment practices that reward strategic, autonomous learning.

INTEGRATIVE CRITICAL ANALYSIS

Convergent Findings and Emerging Consensus

A critical synthesis of the six core source texts reveals several points of robust convergent evidence that collectively constitute an emerging consensus in the VLS literature.

First, there is unequivocal agreement that vocabulary acquisition is best conceptualized as a gradual, incremental process involving multiple exposures and varied forms of cognitive engagement with target words, rather than a discrete, single-exposure learning event (Gu, 2003; Mehrabian & Salehi, 2019; Nation, 2013). This challenges traditional pedagogical assumptions that words can be permanently "taught" through isolated, decontextualized direct instruction.

Second, the evidence strongly supports the superiority of combined learning approaches—blending incidental and intentional methods, contextualized and explicit instruction, technology-mediated and teacher-led activities—over any single-mode approach (Dionisio et al., 2022; Ghafar & Mohamedamin, 2022; Gu, 2003). The dichotomies that once dominated the field (e.g., explicit vs. implicit) are giving way to more holistic, integrated pedagogical models.

Third, there is robust convergent evidence linking metacognitive strategy use to superior vocabulary outcomes across diverse learner populations, linguistic backgrounds, and educational contexts (O'Malley et al., 1985; Oxford, 1990; Sulistiyo, 2018). Learners who plan their vocabulary study, monitor their comprehension, evaluate their retention, and adaptively modify their strategy use consistently outperform those who rely on lower-order cognitive strategies (like simple repetition) in isolation. This provides one of the strongest empirical justifications for embedding metacognitive training into vocabulary instruction at all educational levels.

Methodological Limitations and Research Gaps

Despite the richness of accumulated evidence, the VLS research literature is characterized by significant methodological limitations that constrain the generalizability of findings.

The most pervasive limitation is the overreliance on self-report questionnaires—particularly adaptations of Schmitt (1997) VLS questionnaire and Oxford's (1990) SILL—as the sole or primary data collection instrument. While these tools are administratively convenient and have yielded valuable macro-level data about learner preferences, they are fundamentally limited by social desirability bias (learners reporting what they think the researcher wants to hear), retrospective distortion (inability to accurately recall past strategic behaviors), and the critical limitation that learners may report using strategies they believe are desirable without those reports reflecting their actual, spontaneous cognitive behavior during real-time language tasks (Gu, 2003; Rivera-Mills & Plonsky, 2007).

A further limitation is the predominance of cross-sectional, single-institution studies with limited sample sizes, particularly in investigations of EFL learner populations (Ghafar & Mohamedamin, 2022; Mehrabian & Salehi, 2019). Such designs preclude causal inference regarding the directionality of the relationship between strategy use and proficiency (i.e., does strategy use cause higher proficiency, or does higher proficiency enable more sophisticated strategy use?). The literature also suffers from a relative absence of longitudinal research examining how VLS use evolves across extended periods of L2 development—a gap that is highly consequential given the established understanding that vocabulary acquisition is a long-term, non-linear developmental process (Gu, 2003; Nation, 2013).

Perhaps the most significant theoretical gap identified across the source texts concerns the systemic under-examination of contextual variables. Most VLS research has historically treated context as a nuisance variable to be controlled or held constant, rather than as a substantive, interactive variable in its own right. Gu (2003) is most explicit in articulating this limitation, arguing that conceptions of learning differ fundamentally across cultures, and strategies deemed effective in one educational tradition may be inappropriate or ineffective in another. The field must move beyond single-context, decontextualized designs toward genuinely comparative, cross-cultural investigations that treat the sociocultural environment as a primary explanatory variable.

Pedagogical Implications

The rigorous synthesis of evidence across the six core texts yields a coherent, actionable set of pedagogical implications for vocabulary instruction in L2 contexts:

- a. **Redefining Vocabulary Pedagogy:** Instructors must resist the pervasive reduction of vocabulary teaching to the mere transmission of word lists and bilingual definitional glosses. Effective vocabulary pedagogy must encompass deliberate, sustained attention to multiple dimensions of word knowledge—orthographic form, phonological form, meaning, collocational behavior, pragmatic appropriateness, and morphological structure—through varied, authentic, and contextually rich activities that promote deep lexical processing (Gu, 2003; Nation, 2013).
- b. **Embedded Strategy Instruction:** Strategy instruction should be seamlessly embedded within regular classroom practice rather than relegated to occasional, decontextualized workshops. Instructors should explicitly model VLS use—narrating their own internal strategic decision-making when encountering unfamiliar words in texts ("think-alouds"), demonstrating dictionary consultation strategies that focus on usage rather than just definition, and scaffolding the collaborative development of semantic networks—while creating structured opportunities for learners to practice and reflect upon their own strategy use (Ghafar & Mohamedamin, 2022).
- c. **Principled Technological Integration:** Technology should be deployed as a pedagogically principled supplement to, rather than a replacement for, high-quality, interactive vocabulary instruction. Digital platforms yield the highest returns when they incorporate spaced repetition algorithms, provide authentic contextual examples (rather than isolated sentences), and include metacognitive prompts that require learners to reflect on their learning processes (Dionisio et al., 2022).
- d. **Aligning Assessment with Depth:** Assessment practices must be aligned with the multi-dimensional nature of vocabulary knowledge. Testing must move beyond simplistic, superficial multiple-choice recognition tasks to include measures of productive use, collocational knowledge, semantic mapping, and contextual appropriateness. Such assessments provide more informative diagnostic data and signal to learners that deep vocabulary knowledge is valued, thereby shaping their strategic orientation toward more elaborative, durable learning approaches (Mehrabian & Salehi, 2019; Sulistiyo, 2018).
- e. **Addressing Socio-Affective Dimensions:** Instructors must be highly attentive to the socio-emotional dimensions of vocabulary learning. This involves creating psychologically safe classroom environments where linguistic risk-taking and strategic experimentation are valued, where anxiety around unfamiliar vocabulary is explicitly normalized and addressed, and where learners' highly individualized difference profiles (gender, cultural background, motivation, learning style) are acknowledged and pedagogically accommodated (Asgari & Mustapha, 2012).

Future Research Directions

Several critical priority areas for future empirical investigation emerge from this comprehensive review:

- a. **Longitudinal and Mixed-Methods Designs:** Longitudinal studies examining VLS development over extended periods (months or years, rather than weeks) are urgently needed to establish causal mechanisms. These studies must employ mixed-methods designs that triangulate self-report data with more objective measures, including real-time think-aloud protocols, learner diaries, screen-tracking data for digital tools, behavioral observations, and standardized vocabulary assessments.
- b. **Comparative Cross-Cultural Investigations:** Research that explicitly investigates how specific educational traditions, cultural conceptions of learning, and sociocultural contexts moderate VLS effectiveness would substantially advance the field. Studies comparing VLS use across distinct cultural paradigms (e.g., Confucian-heritage cultures vs. Western educational contexts) could provide nuanced insights into the ecological validity of current taxonomies.
- c. **Rigorous Evaluation of Training Models:** The efficacy of different models of LLS/VLS training—including standalone strategy-based instruction, embedded strategy training, and self-regulatory learning interventions—requires more rigorous, randomized controlled experimental investigation. Such research is particularly needed in under-resourced EFL contexts where institutional constraints severely limit instructional time (Ghafar & Mohamedamin, 2022).
- d. **Mechanisms of Digital Vocabulary Learning:** The intersection of technology-enhanced learning and VLS warrants dedicated, granular investigation. While existing studies confirm that digital tools produce vocabulary gains, the specific cognitive and psycholinguistic mechanisms through which different tool types (e.g., SRS vs. gamified VR environments) promote different forms of lexical knowledge (breadth vs. depth, receptive vs. productive) remain incompletely understood (Dionisio et al., 2022).
- e. **The Role of Affect and Emotion:** Greater empirical attention to the role of affect—including foreign language enjoyment, foreign language anxiety, academic self-efficacy, and emotional engagement in digital environments—in moderating the effectiveness of specific VLS categories would complement the predominantly cognitive framing that currently dominates the VLS literature.

CONCLUSIONS

This review has synthesized theoretical frameworks and empirical evidence across six foundational scholarly works to construct a comprehensive, critical account of vocabulary learning strategies in second language acquisition. The convergent picture that emerges is one of productive complexity: vocabulary acquisition is a multidimensional, developmental process that fiercely resists reduction to any single pedagogical formula or strategic prescription. The person-task-context-strategy tetrahedral model (Gu, 2003) provides a robust, theoretically sound analytical framework for understanding the highly conditional, context-dependent nature of VLS effectiveness, and for generating productive hypotheses about the complex interactions among learner characteristics, task demands, environmental factors, and strategic behavior.

The evidence consistently and robustly affirms that learners who engage in deliberate, metacognitively informed, and strategically diversified vocabulary study outperform those who rely on surface-level, reactive strategies. Simultaneously, the research warns strongly against prescriptive, monolithic approaches that assume a universally optimal strategy or set of

strategies; what works brilliantly for one learner in one specific context may be ineffective or fundamentally counterproductive for another. The central pedagogical task, therefore, is one of cultivating deep learner awareness—helping students understand the vast range of strategies available to them, experiment with unfamiliar and potentially challenging approaches, and develop the metacognitive capacity to critically evaluate and adapt their strategy use in real-time response to shifting task demands and learning outcomes.

However, it is essential to acknowledge the inherent limitations of this review, most notably its reliance on a purposive, deeply analytical sample of only six core sources. While this focused approach allowed for the rich, theoretical depth necessary to address the complex research questions, it inherently limits the breadth of empirical studies synthesized. Consequently, the findings and implications presented here are best interpreted as a theoretically grounded critical synthesis rather than a comprehensive statistical meta-analysis. As the field of SLA continues to evolve—driven by rapid technological innovation, shifting global instructional contexts, and deepening neurocognitive theoretical understanding—the central insight of this review retains its profound relevance: effective vocabulary learning is never the passive accumulation of decontextualized word-meaning pairs, but an active, highly strategic, socially situated, and ultimately transformative engagement with the lexical architecture of a second language. Supporting that engagement with research-informed pedagogy, rigorous empirical inquiry, and genuine respect for learner diversity remains the enduring challenge and paramount opportunity of vocabulary instruction in SLA.

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