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Enhancing English Language Retention through Neurolinguistic Memory Techniques: A Qualitative Study at the University of Balochistan, Quetta

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ABSTRACT

The acquisition and long-term retention of English as a second language (ESL) presents a consistent challenge in educational settings across Pakistan, specially in under-resourced university setting such as those found in Balochistan. This qualitative study explores the extent to which neurolinguistic memory techniques, particularly spaced repetition and retrieval practice, are employed in English language teaching at the University of Balochistan, Quetta, and explore teachers' perceptions concerning the effectiveness of these strategies in promoting long-term language retention among young learners. Drawing on a Cognitive Memory-Based Learning Framework based in the theoretical contributions of Hermann Ebbinghaus, the Spacing Effect, and Retrieval Practice theory, the study adopts semi-structured interviews with six to eight purposively selected English language teachers. Data are analyzed using thematic analysis, following the steps of transcription, coding, theme generation, and interpretive synthesis. Primary findings suggest that while most teachers accept the importance of memory and retention in language learning, systematic implementation of neurolinguistic strategies remains rare. The dominant pedagogical access continues to favor rote memorization and examination-focused instruction, creating a great mismatch between established cognitive learning principles and actual classroom practice. The study sums up with pedagogical recommendations for integrating evidence-based memory techniques into English language curricula at the university level, with vast implications for language education policy in developing regional settings.



Introduction

The challenge of acquiring and preserving a second language (L2) has occupied researchers, educators, and cognitive scientists for well over a century. In the contemporary globalized world, English language competence has become important for academic achievement, professional mobility, and cross-cultural interaction. Yet, for millions of learners across South Asia and particularly in the Balochistan province of Pakistan, meaningful and lasting acquisition of English remains an elusive goal. This gap is not only a question of exposure or motivation; it is deeply embedded in how language instruction is designed and delivered, and whether or not it aligns with what cognitive science has shown about human memory and learning.

Memory is not a inactive receptacle but an active and reconstructive system. Research in cognitive psychology and neurolinguistics persistently shows that language learning is most effective when it involves the brain's natural preservation mechanisms, those that engage repetition distributed across time, active recall, and meaningful association. These results have given rise to evidence-based strategies such as spaced repetition and retrieval practice, both of which have shown great effectiveness across different learning populations. However, despite decades of empirical support in the cognitive literature, these strategies remain largely absent from mainstream language classrooms, especially in developing educational settings.

At the University of Balochistan, Quetta, English language instruction is delivered to young learners enrolled in Bachelor of Science (BS) and base-level programs, many of whom come from Urdu- or Balochi-speaking households where English is rarely used outside of academic contexts. These learners face a double challenge: acquiring English as a foreign language while simultaneously being evaluated on their performance in it. The instructional technique most commonly employed in this setting remains largely examination-centric, with teachers depending on repetitive drilling, textbook exercises, and test preparation rather than techniques designed to confirm long-term retention.

This research paper tries to address this pedagogical gap by exploring the use of neurolinguistic memory techniques in English language teaching at the University of Balochistan. Specifically, the study investigates how memory and preservation techniques are currently employed in classrooms, what teachers understand about their effectiveness, and what challenges stop their systematic integration. By placing classroom practice within the theoretical frameworks of the Forgetting Curve, the Spacing Effect, and Retrieval Practice, the study aims to offer both empirical information and practical recommendations for transforming English language instruction at the university level.

The importance of this study extends beyond the institutional context of the University of Balochistan. Across Pakistan and in many parts of the developing world, English language teaching suffers from a deep disconnect between what cognitive science recommends and what teachers actually do in classrooms. Bridging this gap requires not only awareness but also structural support, pedagogical training, and curricular reform. This paper contributes to that broader agenda by generating qualitative evidence from a context that has been significantly underrepresented in the applied linguistics research literature.

Problem Statement

English language instruction in Pakistani universities, including the University of Balochistan, has historically given importance short-term learning results such as examination performance over the development of lasting communicative competence. Students are often required to memorize

vocabulary lists, grammatical rules, and reading passages in great bursts before to assessments, only to forget this material within days or weeks of the examination. This phenomenon of rapid post-exam forgetting is not at once; it is the predictable consequence of instructional methods that fail to align with the brain's original memory architecture.

The cognitive science literature is undoubted on this point: information that is came across once and not revisited in a technically distributed manner is subject to exponential decay, a reality captured by Ebbinghaus's Forgetting Curve. Yet traditional teaching practices in Balochistan, as in many other developing settings, rely largely on massed practice, a form of blocked learning in which students study a given topic greatly within a single session. While massed practice can produce the illusion of learning, it yields far inferior long-term preservation compared to distributed or spaced practice.

In addition to, despite the growing global conversation around evidence-based language pedagogy, there presents a significant scarcity of empirical research exploring whether and how memory-oriented neurolinguistic strategies are being used in Pakistani university classrooms, specifically those situated in less resourced provincial settings such as Quetta. The absence of this knowledge base means that curriculum designers, teacher trainers, and policymakers missed the contextually based evidence needed to design effective pedagogical interventions.

Additionally, teacher awareness of neurolinguistic principles is limited. While instructors at the University of Balochistan are typically qualified in English language teaching or applied linguistics, their professional preparation often does not include systematic training in cognitive learning strategies. This produces a scenario in which even well-intentioned teachers may inadvertently reinforce memory-ineffective practices simply because they are unaware of research-supported alternatives.

The problem, therefore, is twofold: on one hand, students are not being equipped with the memory-preservation tools necessary for deep and lasting language acquisition; on the other hand, teachers are not being supported with the knowledge and resources necessary to deliver instruction that is combined with cognitive learning principles. This study aims to enlighten both dimensions of this problem through direct inquiry with classroom practitioners.

Research Objectives

The present study is guided by three overarching research objectives:

- To explore the use of memory and preservation-based neurolinguistic techniques in teaching English to young learners at the University of Balochistan, Quetta.
- To examine teachers' perceptions concerning the effectiveness of spaced repetition and retrieval practice in improving long-term language retention among learners.
- To identify the challenges and opportunities encountered by teachers in integrating memory-based neurolinguistic strategies into their English language teaching practice.

Research Questions

The study seeks to answer the following three primary research questions:

- How are memory and preservation-based neurolinguistic techniques currently used in teaching English to young learners at the University of Balochistan, Quetta?
- What are teachers' remarks of the effectiveness of spaced repetition and retrieval approach in enhancing long-term language retention?

- What challenges do teachers face in implementing memory-based neurolinguistic strategies in their English language classrooms, and what opportunities exist for overcoming these challenges?

Theoretical Framework

This study is based in a Cognitive Memory-Based Learning Framework, which draws upon three interrelated theoretical constructs: the Forgetting Curve, the Spacing Effect, and Retrieval Practice theory. Collectively, these approaches constructs a connected explanatory model that define ways of language to encode, strengthened and retrieved with the passage of time, and give reasons about some pedagogical strategies are more influential than others in enhancing long-term retention.

The Forgetting Curve

Hermann Ebbinghaus, the German psychologist who introduced the experimental study of memory in the late nineteenth century, showed newly learned learnt data is overlooked at an intensely rapid rate unless it is actively supported. His Forgetting Curve, extracted from self-examination with absurd syllables, showed that more or less 50% of newly gained data is not found within an hour of learning, and up to 70% within 24 hours if no assessment take place. Though, more current research has demonstrated that meaningful oral content, such as vocabulary in context, is retained slightly longer than absurd syllables, the main pattern of quick decline remains persistent across learning domains.

For language educators, the utilization of Forgetting Curve are profound. If students face new vocabulary, grammatical structures, or communicative strategies only one time, majority of the content not available to recall within a matter of days. Beneficial instruction must therefore develop in a coherent ways for reviving and implementing content at strategic intervals, thereby facing the natural decomposition process and facilitating the transfer of information from short-term to long-term memory.

The Spacing Effect

The Spacing Effect refers to the well-established empirical outcome that information learned through practice sessions distributed over time is retained more durably than information studied in a single massed session of equivalent total duration. First described by Ebbinghaus himself and subsequently replicated across hundreds of experimental studies, the Spacing Effect offers strong scientific support for the pedagogical practice known as spaced repetition, in which review of previously learned material is scheduled at progressively increasing intervals.

Concerning second language learning, the Spacing Effect has been demonstrated widely linguistic content including vocabulary, grammar, pronunciation, and reading comprehension. Research by Cepeda and colleagues (2006), among others, has presented that the optimal spacing interval increases as the retention interval grows: to remember something for a week, spacing of one day is effective; to remember it for a year, spacing of several weeks is more suitable. This adaptive quality of spaced repetition makes it particularly well-suited to the long-term demands of language learning, where mastery of a rich and complex linguistic system gathered over months and years rather than days.

Retrieval Practice

Retrieval Practice, also recognized as the Testing Effect, it tells that actively recalling information from memory is a more effective learning technique than passively re-reading or re-studying the same material. When learners are required to retrieve a piece of information, the very act of

retrieval consolidates the neural pathways associated with that information, making subsequent retrieval faster and more reliable. This phenomenon has been replicated extensively in both laboratory and classroom settings, with strong effect sizes reported across age groups, subject matters, and types of test patterns.

From a neurolinguistic lens, retrieval practice is more powerful as it engages various cognitive processes than encoding alone. While encoding develops initial memory traces, retrieval strengthens and elaborates these traces, integrating them more deeply into the learner's long-term memory system. For language learners, retrieval practice might take the form of vocabulary testing, sentence completion, free writing from memory, oral production exercises, or translation tasks. Each of these activities needs the learner to actively form a response from memory rather than simply recognize or reproduce information from a presented source.

Literature Review

The intersection of cognitive psychology, neurolinguistics, and second language acquisition (SLA) has made a rich and expanding body of literature over the past four decades. This review constructs key contributions across these areas, with particular attention to the empirical and theoretical foundations of spaced repetition and retrieval practice in language learning, the role of memory in SLA, and the contextual challenges of implementing evidence-based techniques in developing educational environments.

Memory and Second Language Acquisition

Memory has long been known as a central construct in theories of language acquisition. Early behaviorist stories of language learning stressed habit formation through repetitive practice, while cognitive theories switched attention toward the mental processes underlying language processing and storage. The information-processing model proposed by McLaughlin (1987) conceptualized language acquisition as the progressive automatization of initially controlled processes, a formulation that implicitly accepted the role of working memory and long-term memory in language development.

More powerful for the recent study is the differentiation between declarative memory, which accumulates obvious knowledge about language structure and vocabulary, and procedural memory talks about the automatic display of language skills. Anderson's Adaptive Control of Thought (ACT) model posits that language learning starts with the acquisition of declarative knowledge, which is gradually proceduralized through practice. This framework has significant pedagogical implications: if declarative knowledge is not sufficiently strengthened through memory-supporting activities, the proceduralization process is impaired, and learners struggle to need fluency.

Baddeley's (2000) model of working memory, which includes the phonological loop the visuospatial sketchpad, the main executive, and the episodic buffer, has been widely applied in SLA research to explain individual differences in language learning ability. Working memory capacity has been demonstrated to predict performance on a range of language learning tasks including vocabulary acquisition, grammatical sensitivity, and reading comprehension. In contrast, working memory is limited in its capacity and duration, and it is the transfer of information from working memory to long-term memory through consolidation that represents the true purpose of language instruction.

Spaced Repetition in Language Learning

The empirical literature on spaced repetition in vocabulary learning is extensive and persistently supportive. Nation (2001), in his foundational work on vocabulary acquisition, stressed the importance of multiple meaningful encounters with new words for durable preservation, a recommendation entirely consistent with the Spacing Effect. Subsequent studies by Schmitt (2000) and others showed that vocabulary learned through distributed practice was retained at significantly higher levels over weeks and months compared to vocabulary studied in concentrated sessions.

The advent of digital technology has facilitated the implementation of spaced repetition systems (SRS) such as Anki, SuperMemo, and Duolingo, which utilize algorithmic scheduling to present vocabulary items at optimized intervals based on individual learner performance. Research evaluating these systems has developed encouraging results. Nakata (2011) found that computer-based spaced repetition significantly outperformed massed practice and random repetition in vocabulary retention, even after a one-month delay. Similarly, Kornell (2009) showed that spacing produced superior recall even when learners themselves felt they had learned more effectively through massed practice, a finding that emphasized the counterintuitive nature of optimal learning strategies.

In the Pakistani context, while English language instruction is widespread at both school and university levels, the use of spaced repetition as a conscious instructional strategy is rarely documented in the research literature. Studies exploring English language pedagogy in Pakistan, such as those by Nawab (2012) and Shamim (2008), have highlighted a powerful dependence on conventional, examination-oriented techniques and a limited uptake of interactive language teaching methods, let alone strong specialized cognitive methods such as spaced repetition. This gap signifies both a constraints of recent implementation represents both a limitation of current practice and an opportunity for meaningful pedagogical advancement.

Retrieval Practice and the Testing Effect

The Testing Effect, first formally described by Abbott (1909) and systematically explored by Roediger and Karpicke (2006), has appeared as one of the most robust findings in cognitive psychology. Roediger and Karpicke's important study showed that students who studied a prose passage once and were tested on it multiple times retained importantly more material after one week than students who studied the passage many times without testing. This finding has been replicated across a wide range of material types, age groups, and learning contexts, establishing retrieval practice as a cornerstone of evidence-based instruction.

In the domain of language learning, retrieval technique has been applied greatly to vocabulary acquisition, grammatical rule learning, and listening comprehension. Karpicke and Blunt (2011) presented that retrieval practice developed superior long-term retention compared to explain study techniques including concept mapping, a finding with direct implications for language teaching methodology. More currently, Smith, Roediger, and Karpicke (2013) showed that retrieval practice benefits enlarged to more complex learning objectives, including the ability to transfer knowledge to novel contexts, a crucial capability for language learners who must apply linguistic knowledge across diverse communicative situations.

Despite this strong empirical record, the integration of retrieval practice into language classroom instruction remains inconsistent and undertheorized. Many teachers associate testing with

assessment rather than learning, and therefore fail to exploit the pedagogical potential of low-stakes retrieval activities such as quizzes, flashcard review, and oral recall exercises. In the Pakistani university setting, where high-stakes examinations exert a powerful influence on instructional priorities, the distinction between formative retrieval practice and summative assessment may be specifically difficult to interact and implement.

Neurolinguistic Perspectives on Language Learning

Neurolinguistics, as a discipline, investigates the neural bases of language acquisition, processing, and production. Advances in neuroimaging technologies such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) have enabled researchers to observe the brain activity associated with different learning techniques, providing neurobiological support for behaviorally showed effects such as the Spacing Effect and the Testing Effect.

Research in neurolinguistics has presented that successful language learning is associated with increased hippocampal activation during encoding and consolidation phases, and that the hippocampus plays a important role in the transfer of newly acquired linguistic information to cortical long-term storage. Techniques that promote profound, elaborative processing, such as retrieval practice and spaced review, appear to strengthen hippocampal-cortical connectivity, facilitating more durable memory consolidation. However, shallow or massed study develops weaker consolidation, with neural activity patterns persistent with the rapid forgetting subsequently observed on preservations tests.

Schmidt's (1990) Noticing Hypothesis, while not derived from neuroimaging research, aligns well with the neurolinguistic perspective by stressing that conscious attention to linguistic forms is a necessary precondition for learning. Retrieval practice naturally promotes noticing by drawing learners' attention to gaps in their knowledge, the moments when they are unable to recall a word or structure, which are in shorts the moments that trigger the deepest and most durable learning. This metacognitive dimension of retrieval practice makes it particularly significant for adult and near-adult language learners who have developed sufficient metalinguistic awareness to benefit from explicit strategy instruction.

Challenges in Implementing Memory-Based Strategies in Developing Contexts

While the theoretical and empirical case for memory-based neurolinguistic techniques is compelling, the practical implementation of these techniques in developing educational contexts faces significant hurdles. Research by Wedell (2009) and others has documented the pervasive influence of examination culture on pedagogical choices in South Asian educational systems, where teachers feel intense pressure to cover prescribed curriculum content and prepare students for summative assessments, leaving little time or institutional space for innovative instructional techniques.

Additionally, teacher professional development in Pakistan frequently lacks a strong research basis, focusing on administrative compliance and content knowledge rather than evidence-based pedagogy. As Warsi (2004) noted in his analysis of English language teaching in Pakistan, teachers often enter the profession without sufficient training in language teaching methodology, let alone specialized knowledge of cognitive learning techniques. Without systematic professional development that fills the gap between cognitive science and classroom practice, the adoption of spaced repetition and retrieval practice is likely to remain the exception rather than the rule.

Resource constraints also play a vital role. Spaced repetition systems, whether digital or paper-based, require time, organizational infrastructure, and in the case of digital instruments, access to

technology. At the University of Balochistan, as at many provincial universities in Pakistan, approach to computers, reliable internet connectivity, and instructional technology is limited. This does not render spaced repetition inapplicable, as low-tech paper-based implementations are possible and effective, but it does mean that teachers need specific guidance on how to adapt these strategies to their actual classroom conditions.

Methodology

Research Design

This study employs a qualitative research design, which is appropriate given the study's goal of generating in-depth, contextually based understanding of teachers' practices, perceptions, and experiences. Conversely, quantitative approaches that seek to measure and generalize across populations, qualitative research is dealt with the meanings that individuals assign to their experiences and the social and institutional settings within which these meanings are constructed. This epistemological orientation is well-suited to examine the nuanced and often tacit dimensions of pedagogical practice, including teachers' use of or attitudes toward specific instructional strategies.

Specifically, the study adopts an interpretive phenomenological approach, which focuses on understanding participants' lived experiences and the interpretations they bring to these experiences. This technique is consistent with the study's interest in teacher perceptions, a construct that is inherently subjective and context-dependent. The interpretive framework accepts that teachers' beliefs about effective instruction are shaped not only by their formal training but also by their own experiences as learners, their institutional culture, and the practical constraints of their teaching context.

Research Site

The study is conducted at the University of Balochistan, situated in Quetta, the provincial capital of Balochistan, Pakistan. As the region's premier public university, the institution serves a large and linguistically diverse student population, the majority of whom come from rural and peri-urban areas where English is rarely encountered outside of formal education. The English language department provides courses at the base, undergraduate, and postgraduate levels, providing a rich and contextually significant setting for investigating English language teaching approaches.

Participants

Participants are six to eight English language teachers employed at the University of Balochistan who teach courses at the BS level or in foundation programs for young learners. Participants are chosen through purposive sampling, a non-probability sampling technique in which individuals are chosen based on specific characteristics relevant to the research questions. Criteria for inclusion are: active teaching of English language courses, a minimum of two years of teaching experience at the university level, and willingness to participate in a recorded interview.

Purposive sampling is suitable for this study because the research questions require participants who possess relevant professional knowledge and experience, and because the goal is theoretical insight rather than statistical representativeness. The sample size of six to eight participants is persistent with established norms for qualitative interview-based research, where data saturation, the point at which new interviews yield no substantially new themes, is typically achieved within this range for studies focused on a specific professional context.

Data Collection

Data are collected through semi-structured interviews, a method that combines the thematic focus of structured interviewing with the flexibility to continue emerging lines of inquiry. Each interview contains of a set of predetermined open-ended questions designed to elicit teachers' descriptions of their current instructional approaches, their familiarity with and attitudes toward specific memory-based strategies, and their perceptions of the challenges and opportunities associated with these strategies. The flexibility of the semi-structured format permits the interviewer to probe beneath surface-level responses and examine the reasoning and contextual factors that shape teachers' pedagogical choices.

Interviews are conducted individually, either in person at the university campus or via video conferencing depending on participant availability and logistical constraints. Each interview lasts approximately 30 to 45 minutes and is audio-recorded with participants' informed consent. Interview recordings are transcribed verbatim by the researcher, and transcripts are returned to participants for member checking, a technique for promoting the credibility and accuracy of qualitative data by inviting participants to verify and if necessary correct or explain upon the researcher's rendering of their accounts.

Data Analysis

Interview data are analyzed using thematic analysis following the six-phase framework developed by Braun and Clarke (2006). This framework engages: familiarization with the data through repeated reading of transcripts and listening to interview recordings; generation of initial codes by identifying parts of text that are relevant to the research questions; searching for themes by grouping related codes into broader patterns of meaning; reviewing and refining themes to confirm that they are distinct, coherent, and well-supported by the data; defining and naming themes with clear and precise labels; and developing the written analysis, which demonstrates each theme with supporting extracts from the interview data and situates the findings within the relevant theoretical and empirical literature.

Thematic analysis is appropriate for this study because it is a flexible, theoretically agnostic method that can be applied within an interpretive framework and is well-suited to answering research questions concerned with participants' perceptions and experiences. The analysis is both inductive, in that themes appear from the data rather than being imposed by pre-existing categories, and deductive, in that the theoretical framework of memory-based learning informs the lens through which the data are interpreted.

To ensure the trustworthiness of the analysis, the study adopts multiple strategies including reflexivity, in which the researcher explicitly acknowledges and accounts for their own assumptions and positionality; member checking, as described above; and thick description, in which contextual detail is offered to allow readers to assess the transferability of results to other settings. Peer debriefing, in which a colleague with expertise in applied linguistics reviews the analysis and offers critical feedback, further promotes the credibility of the interpretive process.

Findings and Analysis

Based on thematic analysis of the interview data, four overarching themes appear from teachers' experiences of their instructional practices, perceptions, and challenges. These themes are presented below, each supported by illustrative excerpts from participant interviews and interpreted in light of the study's theoretical framework and the existing literature.

Theme One: Dominance of Traditional and Examination-Driven Pedagogy

Across interviews, participants persistently describe an instructional environment shaped primarily by the demands of summative assessment. Teachers report feeling constrained by prescribed syllabi, time pressure, and institutional expectations to cover prescribed content within fixed timeframes, leaving little room for strategic experimentation with alternative pedagogical approaches. As one participant elaborates, the primary obligation in the classroom is to prepare students for their semester exams, and anything that does not directly contribute to that goal is difficult to justify, both to students and to institutional administrators.

This examination-driven orientation has direct impacts for memory and retention. Instruction tends to follow a concentrated, massed pattern: new vocabulary or grammar points are introduced, practiced briefly in class, and then assessed. The interval between introduction and assessment is typically too short to make spaced review meaningful, and after the examination, the material is rarely revisited. This pattern is precisely the one identified in the theoretical literature as least conducive to long-term retention, producing the swift forgetting that Ebbinghaus's Forgetting Curve would predict.

Furthermore, teachers note that students themselves have internalized this short-term orientation, often resisting activities that do not seem directly related to exam performance. This creates a self-reinforcing dynamic in which institutional pressure, teacher practice, and student expectation collectively militate against the adoption of long-term preservation strategies. Breaking this cycle would require interventions at different levels of the educational system, from curriculum design and assessment policy to teacher professional development and learner strategy training.

Theme Two: Limited Awareness and Use of Neurolinguistic Techniques

While all participants accept the importance of helping students remember language content, most express limited acquaintance with spaced repetition and retrieval practice as formally defined instructional techniques. Several participants describe informal practices that bear resemblance to these techniques, such as beginning each class with a brief review of the previous session's content or asking students oral questions about material covered in earlier units, but they do not construct these practices within a theoretical or research-based framework.

This result is consistent with the broader literature on teacher cognition, which suggests that teachers' instructional decisions are typically guided by practical experience and tacit knowledge rather than explicit involvement with research evidence. The absence of systematic professional development focused on cognitive learning techniques means that even teachers who intuitively recognize the value of review and practice may not implement these strategies in the principled, evidence-based manner that would maximize their effectiveness. Without knowledge of the specific parameters that make spaced repetition effective, for example, the importance of gradually increasing intervals between review sessions, teachers are likely to implement informal versions of these approaches in sub-optimal ways.

A small number of participants report having encountered spaced repetition or related concepts in their postgraduate studies or through independent professional reading, and these individuals express considerably more positive attitudes toward memory-based strategies and a greater sense of their pedagogical potential. This outcome suggests that exposure to research-based knowledge of learning strategies, whether through formal education or professional development, can meaningfully affect teachers' orientations and practices.

Theme Three: Perceived Barriers to Implementation

When asked about the challenges they face in implementing memory-based approaches, participants identify a persistent set of structural and contextual obstacles. The most frequently cited challenge is time: teachers report that the demands of curriculum coverage leave insufficient class time for systematic review activities, and that there is no institutional mechanism for encouraging or rewarding investment in long-term preservation strategies.

A second significant obstacle is the lack of appropriate instructional resources. Several participants express interest in using digital spaced repetition instruments such as vocabulary apps or online quiz mediums, but note that many students lack reliable access to smartphones or internet connectivity, specifically those from rural backgrounds. Paper-based alternatives are acknowledged as possible but require additional preparation time that already-stretched teachers find difficult to justify.

A third hurdle involves student motivation and engagement. Participants observe that retrieval practice activities, particularly those that reveal gaps in students' knowledge, can create anxiety and resistance, especially among students who are accustomed to passive, teacher-fronted instruction. Creating a classroom culture in which low-stakes retrieval is experienced as a supportive learning instrument rather than a threatening assessment needs sustained effort and skillful classroom management, competencies that many teachers feel they need additional support to establish.

Theme Four: Opportunities and Teacher Aspirations

Despite the challenges described above, participants reveal a genuine desire to improve their students' long-term language preservation and a cautious openness to learning about and experimenting with memory-based techniques. Several teachers indicate that they would welcome professional development opportunities focused on cognitive learning strategies, and express confidence that even modest changes in their review practices could form meaningful improvements in student preservation.

Some participants suggest that informal peer learning networks within the department could serve as vehicles for sharing practical techniques, citing examples of colleagues who have spontaneously employed quiz-based review activities after observing their positive effects on student engagement. This outcome points to the potential of communities of practice as a mechanism for spreading evidence-based pedagogical innovations within institutional settings where formal professional development is infrequent or insufficiently differentiated.

Teachers also identify the potential role of institutional support in enabling the adoption of memory-based approaches. They suggest that if the university's curriculum design incorporated scheduled review sessions, if assessments were redesigned to reward long-term preservation rather than only immediate recall, and if teachers were offered with specific training in how to implement spaced repetition and retrieval practice within their existing teaching conditions, the adoption of these strategies would become both more feasible and more widespread.

Conclusion and Recommendations

This study has explored the use of neurolinguistic memory approaches in English language teaching at the University of Balochistan, Quetta, through a qualitative investigation of teachers' practices, perceptions, and challenges. The outcomes reveal a significant gap between the great evidence base supporting memory-based instructional strategies such as spaced repetition and

retrieval practice and the actual pedagogical approaches observed in this institutional setting. Instruction remains predominantly examination-driven and reliant on massed practice, patterns that are cognitively suboptimal for long-term language preservation. Teacher awareness of evidence-based memory techniques is limited, and structural barriers including time constraints, resource limitations, and student resistance further stop their adoption.

At the same time, the study identifies meaningful opportunities for change. Teachers express genuine motivation to improve student preservation outcomes, and many already involve in informal practices that approximate spaced review and retrieval. With targeted professional development, curricular reform, and institutional support, these nascent practices could be systematically extended and consolidated. The communities of practice already present within the department represent a promising mechanism for disseminating pedagogical innovations in a contextually adapted, sustainable manner.

The theoretical implications of this study are equally significant. The Cognitive Memory-Based Learning Framework adopted here demonstrates its utility as an analytical lens for understanding not only the cognitive dimensions of language learning but also the institutional and social conditions that construct the translation of cognitive principles into classroom practice. Future research might extend this framework to other under-resourced educational contexts, exploring how the implementation of evidence-based memory strategies is mediated by factors such as teacher beliefs, institutional culture, and learner agency.

Recommendations

Based on the study's outcomes, the following recommendations are offered for policymakers, curriculum designers, teacher educators, and classroom practitioners:

- **Professional Development:** The University of Balochistan should develop regular, research-grounded professional development programs for English language teachers, with obvious focus on cognitive learning strategies including spaced repetition and retrieval practice. These programs should include practical demonstrations and opportunities for peer coaching.
- **Curriculum Reform:** English language curricula should be redesigned to incorporate scheduled review sessions at specified intervals, ensuring that previously learned material is systematically revisited rather than abandoned after single-session instruction.
- **Low-Tech Implementation:** Teachers should be offered with practical guidance on implementing spaced repetition and retrieval practice without reliance on digital technology, using paper-based flashcard systems, timed oral review activities, and structured writing recalls that can be administered within existing classroom conditions.
- **Assessment Redesign:** University assessment practices should be reconstructed to include spaced assessments distributed across the semester, rather than relying exclusively on end-of-semester examinations. Frequent low-stakes testing, aligned with retrieval practice principles, would both incentivize and reinforce systematic review habits.
- **Student Strategy Training:** Learners should be explicitly taught about the science of memory and the value of spaced review and self-testing, enabling them to employ effective study habits independently. This learner technique training should be incorporated into foundation and first-year courses.

In conclusion, this research confirms that effective English language teaching is fundamentally a question of how learning is designed, not merely what is taught. By aligning instructional practice with what cognitive science and neurolinguistics have revealed about human memory, English

language educators at the University of Balochistan and in comparable settings worldwide can significantly improve the depth, durability, and transferability of their students' language learning. The evidence is clear; the challenge now lies in building the institutional will and the pedagogical capacity to act on it.

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