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**NLP Interventions on Mind Maps: Improving
Reading Skills of Pakistani English Language Learners**



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Abstract

This research examines the effectiveness of Neuro-Linguistic Programming (NLP) techniques in enhancing reading comprehension among Pakistani English as a Second Language (ESL) learners, particularly focusing on the cognitive processes of learners as illustrated through mind maps. The study investigates how techniques such as visualization, chunking, anchoring, and reframing affect learners' mental organization during reading tasks, with the goal of improving both comprehension and engagement. Utilizing a mixed-methods interventionist design, the study involved 60 secondary-level ESL students over a two-week period. Pre-test questionnaires evaluated learners' initial reading levels and cognitive structures. During the intervention, NLP-based strategies were integrated into daily reading lessons. Post-test data were gathered through updated questionnaires, semi-structured interviews, and a comparative analysis of learners' mind maps before and after the intervention. The results indicated significant cognitive and emotional changes in learners' reading strategies. NLP techniques contributed to a reduction in reading-related anxiety, fostered positive associations with reading, and encouraged deeper information processing. Learners' mind maps after the intervention exhibited clearer organization, stronger conceptual connections, and improved integration of new information with prior knowledge. Interview data also reflected increased motivation, self-awareness, and confidence in reading tasks. This study concludes that combining NLP techniques with visual tools like mind mapping provides an effective, learner-centered approach to tackling the challenges ESL learners face in reading comprehension. It offers a promising pedagogical model for Pakistani classrooms where rigid, traditional methods prevail. The findings suggest broader implications for enhancing second

language instruction by aligning teaching methods with the cognitive and emotional needs of learners.

Key Words: Neuro-Linguistic Programming, mind mapping, ESL reading, Cognitive strategies, Intervention, Pakistani learners.

Introduction

In Pakistan, English holds a dual status, serving both as a second language and as the primary medium of instruction in educational institutions. It is also extensively utilized in professional, bureaucratic, and legal contexts. Proficiency in English, particularly in reading skills, is essential for academic success and career advancement. However, many Pakistani learners of English as a second language (ESL) face significant obstacles in developing effective reading skills. These challenges impede their academic progress, limit their ability to engage critically with texts, and restrict their participation in broader intellectual and communicative activities

Reading is a complex cognitive process that requires decoding symbols, interpreting meaning, and integrating prior knowledge to construct understanding. Foundational theories such as Gough's (1972) bottom-up model, Goodman's (1967) top-down approach, and Rumelhart's (1977) interactive model highlight the interplay between text-driven and knowledge-driven processes. Rosenblatt's (1978) transactional model further emphasizes the reciprocal relationship between reader and text, where meaning emerges from individual experiences and context. Research has also underscored the role of cognitive and metacognitive strategies—like inference-making and monitoring comprehension—in reading proficiency (Pressley & Afflerbach, 1995).

In Pakistan, however, English learners often rely on literal translation and memorization, struggling with prediction, coherence, and synthesis due to limited resources and an exam-oriented educational culture (Rahman, 2002; Mahmood, 2014). Addressing these challenges requires tools that make learners' thought processes visible and adaptable. Mind maps, which visually represent connections and hierarchies among ideas, offer valuable insight into how students organize, prioritize, and integrate information during reading.

This study employs mind maps alongside Neuro-Linguistic Programming (NLP), a framework developed by Bandler and Grinder in the 1970s that explores how language and mental patterns influence learning. NLP techniques such as visualization, anchoring, and reframing are used both diagnostically and as interventions to enhance engagement and comprehension. Integrated with mind mapping, they provide a window into learners' cognitive structures while also offering strategies to reshape them.

Grounded in a constructivist paradigm, this research views learners as active meaning-makers and explores how Pakistani ESL students mentally process texts before and after NLP-based interventions. By analyzing changes in mind maps and reading behaviors, the study aims to identify cognitive gaps, enhance strategy use, and design learner-centered approaches to reading instruction. Ultimately, it contributes both theoretical insight into second language acquisition and practical methods for improving reading comprehension in multilingual classrooms.

Research Objectives

This study aims to analyze the mind maps of Pakistani English language learners to understand how they organize information during reading and to

evaluate the effectiveness of NLP techniques such as anchoring, presupposition, and chunking in enhancing comprehension. It also explores the relationship between cognitive patterns in mind maps and reading performance, assessing changes in learners' cognitive and emotional states through pre- and post-test interventions. By identifying key challenges and providing insights into learners' thought processes, the research seeks to develop more effective reading instruction strategies that integrate NLP and cognitive-based approaches within the Pakistani context.

Research Questions

1. How did Pakistani English language learners organize and structure their thoughts while engaging in reading tasks, as reflected in their mind maps?
2. What cognitive patterns and strategies were identified through the application of Neuro-Linguistic Programming (NLP) in the analysis of the mind maps of English learners in Pakistan?
3. How did the cognitive organization, as visualized in mind maps, influence learners' reading comprehension?
4. In what ways did the findings from the analysis of mind maps contribute to the development of more effective teaching methods for enhancing English reading skills among Pakistani learners?
5. What specific challenges did Pakistani English language learners encounter in reading, as identified through the NLP-based analysis of their mind maps?
6. How was Neuro-Linguistic Programming (NLP) utilized to deepen the understanding of the cognitive processes involved in second language acquisition, particularly in reading?

Significance of Study

This study has important implications for improving language instruction in Pakistan. By identifying the cognitive strategies utilized by learners, educators can create more focused and effective interventions to enhance reading skills. Additionally, the research contributes to the wider field of language learning by merging cognitive theory with Neuro-Linguistic Programming (NLP) techniques. This integration provides a more profound understanding of how learners process information and introduces innovative approaches to support skill development in a second language context.

Literature Review

Reading comprehension is a complex cognitive process that plays a crucial role in language acquisition. It encompasses not only the decoding of words but also the interpretation of meaning, the connection of ideas, and the application of background knowledge to synthesize new information (Nation, 2009). For English as a Second Language (ESL) learners, reading can present specific challenges due to unfamiliar vocabulary, syntactic complexity, limited exposure to English in their daily lives, and anxiety associated with tasks in a foreign language. These challenges are particularly pronounced in contexts such as Pakistan, where traditional instruction often prioritizes rote memorization over critical engagement with texts (Rahman, 2002; Mahmood, 2014).

To mitigate these challenges, educators have investigated innovative strategies that address both the cognitive and emotional dimensions of reading. Two such strategies—Neuro-Linguistic Programming (NLP) and mind mapping—provide promising tools for enhancing reading comprehension.

Neuro-Linguistic Programming (NLP) was established in the 1970s by Richard Bandler and John Grinder as a psychological model aimed at understanding how language reflects and influences mental processes. NLP is grounded in the belief that individuals have preferred representational systems—visual, auditory, and kinesthetic (VAK)—and that learning is more effective when instructional methods align with these preferences (Bandler & Grinder, 1979; Dilts, 1999). NLP also includes techniques such as anchoring (associating a positive emotion with a specific stimulus), chunking (dividing information into smaller units), visualization, and reframing, all designed to enhance learning by optimizing cognitive and emotional states (Ready & Burton, 2019; Tosey & Mathison, 2009).

Bandler and Grinder (1979) introduced the concept of representational systems as a key component of Neuro-Linguistic Programming (NLP), suggesting that individuals primarily process experiences through five sensory modalities: visual, auditory, kinesthetic, olfactory, and gustatory (VAKOG). They argued that identifying a person's dominant representational system could improve communication and learning strategies. Tosey and Mathison (2009) supported this idea by highlighting that aligning teaching methods with learners' preferred modalities can significantly enhance engagement and comprehension. Dilts, Grinder, Bandler, and DeLozier (1980) also underscored the practical application of representational systems, particularly in fostering rapport and personal development.

The representational systems model posits that individuals primarily process information through one of three sensory modalities: visual, auditory, or kinesthetic (VAK). Understanding and leveraging these preferences can substantially improve learning outcomes (Dilts, 1999).

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The NLP communication model delineates the cognitive and psychological processes through which external events are perceived, filtered, and internalized, ultimately shaping human behavior. When an external event occurs (represented by the red arrow entering the mind), it is not perceived in its raw form. Instead, it is processed through a set of internal filters, which include time, space, matter, energy, language, memories, decisions, meta-programs, values and beliefs, and attitudes.

These filters are shaped by an individual's life experiences and cognitive frameworks, determining how information is distorted, generalized, or omitted—natural mechanisms of the brain for managing overwhelming sensory input. This filtered information leads to the formation of an internal representation (indicated by the large turquoise arrow pointing toward the brain's internal processing), reflecting how the individual subjectively interprets the external event.

The internal representation directly influences the individual's state (emotional and mental condition) and physiology (bodily reactions), both of which are depicted as interconnected processes. These factors, in turn, determine the individual's behavior (illustrated by the blue arrow pointing outward), completing the stimulus-response cycle.

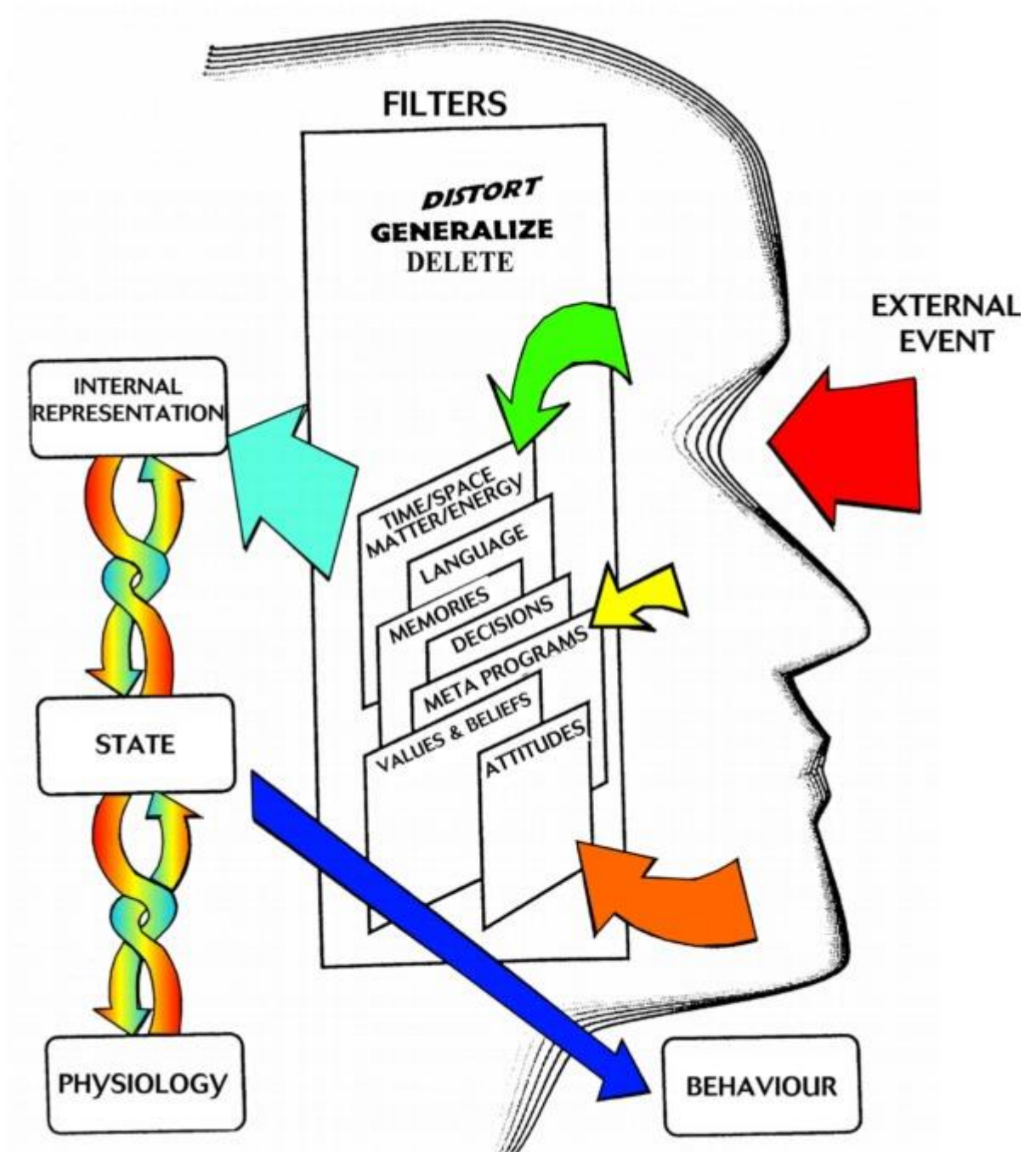


Figure No: 1 **Internal representation of Human State of Mind**

In educational contexts, Neuro-Linguistic Programming (NLP) has been utilized to assist learners in managing anxiety, enhancing focus, and fostering deeper engagement with learning activities. For instance, Knight (2012)

demonstrated that NLP techniques aided English as a Second Language (ESL) learners in improving their reading comprehension by reducing stress and encouraging mental imagery. Similarly, Al-Qahtani (2019) reported that employing timeline and sensory models resulted in increased retention rates and improved reading fluency among ESL students. These methodologies are particularly pertinent in second-language reading, where learners frequently encounter difficulties in forming mental representations of texts due to limited vocabulary or abstract concepts.

However, NLP has faced criticism. Scholars such as Witkowski (2010) and Sharpley (1987) contend that NLP lacks empirical support and that its assertions often depend on anecdotal evidence. Additionally, some researchers have highlighted that the learning styles theory underpinning NLP's VAK model is scientifically debatable (Pashler et al., 2008; Coffield et al., 2004). Despite these criticisms, numerous researchers recognize that when implemented thoughtfully within evidence-based frameworks, NLP techniques can effectively enhance learner motivation, attention, and cognitive control (Archana & Kannadasan, 2024; Mhanna et al., 2024).

In parallel to NLP, mind mapping provides a visual and cognitive approach to organizing information. Introduced by Tony Buzan in the 1960s, mind mapping involves positioning a central concept at the center of a diagram and connecting it to related ideas through branches (Buzan & Buzan, 1996). This format reflects the brain's natural associative mechanisms, enabling learners to visualize connections, group ideas, and construct mental schemas that facilitate comprehension (Buzan, 2010).

Mind mapping is particularly effective in reading instruction, as it assists learners in deconstructing complex texts, identifying key ideas, and retaining

information through visual elements such as color, shape, and imagery. Empirical studies have indicated that mind mapping enhances reading outcomes for ESL learners by improving memory, vocabulary, and conceptual clarity (D'Angelo, 2012; Richardson, 2016). Revell and Norman (1997) found that learners utilizing mind maps exhibited better organization of their thoughts and demonstrated a greater ability to interpret narrative structures compared to those using linear notes.

When incorporated into both pre-reading and post-reading activities, mind mapping can activate prior knowledge, assist learners in establishing goals, and support text analysis. For example, story maps can aid students in visualizing plot structures, character relationships, and cause-effect sequences, all of which are essential for comprehending narrative texts (Knight, 2012; Gambrell & Jawitz, 1993).

Despite its advantages, mind mapping necessitates explicit instruction and practice. Learners who are unfamiliar with visual learning tools may initially find it challenging to convert their thoughts into diagrams (Chamot & O'Malley, 1994). Furthermore, mind mapping is most effective when integrated with cognitive strategies such as prediction, summarization, and questioning, which enhance understanding and critical analysis.

This study builds upon these foundational concepts by implementing NLP techniques in conjunction with mind mapping to evaluate their combined impact on reading comprehension. By examining shifts in learners' cognitive structures and emotional responses, it contributes to the expanding body of literature that advocates for holistic, learner-centered approaches in second language education.

This research adopts a constructivist perspective, viewing learners as active contributors to the process of meaning-making. By analyzing the mind maps created before and after NLP-based reading interventions, the study aims to identify changes in learners' cognitive structures and reading strategies. Specifically, this study employs anchoring, visualization, chunking, and reframing techniques during reading sessions and assesses their effects on comprehension outcomes and the organization of information in the mind.

The utilization of both pre-test and post-test mind maps, alongside structured interviews and observations, facilitates a comprehensive, multi-dimensional understanding of how learners process reading material before and after intervention. This approach not only addresses a gap in ESL research in Pakistan—where both NLP and mind mapping are underutilized—but also provides a replicable model for integrating cognitive and emotional tools into language instruction.

Methodology

Research Design

This study utilized a mixed-methods interventionist research design, integrating both quantitative and qualitative approaches. The overall framework was guided by the constructivist paradigm, which emphasizes the active role of learners in constructing knowledge and organizing information during reading tasks.

Participants

The sample comprised 60 secondary-level ESL learners from diverse academic streams. Participants were selected based on a standardized English

language placement test to ensure a consistent baseline of language proficiency. The study took place in a classroom setting in Pakistan over a duration of two weeks.

Data Collection Instruments

The following tools were used for data collection:

Pre-Test Questionnaires:

- A reading comprehension test to assess learners' baseline understanding.
- A cognitive-style questionnaire designed to explore learners' existing thought structures.

Mind Maps:

Learners created mind maps based on reading tasks to visually represent how they organized and understood information.

Post-Test Instruments:

- A revised version of the reading comprehension test.
- Updated mind maps to reflect cognitive changes.

NLP-based Intervention:

The two-week intervention consisted of daily reading sessions incorporating selected NLP techniques. These included:

Visualization: Learners imagined the content of the text to improve recall and engagement.

Chunking: Texts were broken down into smaller, manageable sections to

reduce cognitive load.

Anchoring: Positive emotional states were linked to reading tasks to reduce anxiety.

Reframing: Learners were encouraged to reinterpret reading difficulties as learning opportunities.

Mind Mapping: Used consistently before and after reading to track changes in cognitive structuring.

Data Analysis

Quantitative Analysis:

Pre- and post-test questionnaire scores were analyzed using descriptive statistics to measure changes in reading comprehension.

Qualitative Analysis:

Learner-generated mind maps were analyzed for structure, clarity, and conceptual connections. Interview responses were thematically coded to identify recurring patterns related to motivation, emotional readiness, and strategy use.

Results

The findings of this study indicated notable enhancements in the reading comprehension skills and cognitive organization of Pakistani ESL learners after the application of Neuro-Linguistic Programming (NLP) interventions combined with mind mapping techniques. Data were gathered through pre- and post-test questionnaires, analyses of mind maps, classroom observations, and semi-

structured interviews. The results are presented in relation to changes in reading performance, cognitive patterns observed in mind maps, and the experiences reported by learners.

Quantitative Findings (Pre- and Post-Test Questionnaire Results):

Descriptive statistical analysis of the pre- and post-test questionnaires indicated a significant enhancement in students' reading comprehension scores following the NLP-based intervention. Students exhibited improved skills in identifying main ideas, making inferences, and connecting various elements within the text. The mean score showed a notable increase, suggesting that the NLP techniques—particularly chunking, visualization, and anchoring—positively influenced comprehension abilities.

Strategy		Pre-Test (%)	Usage	Post-Test (%)	Usage	Change (Δ)
Annotating reading	while	25%		68%		+43%
Using context clues		40%		75%		+35%
Re-reading parts	difficult	55%		80%		+25%
Skipping words	unfamiliar	30%		10%		-20%
Translating to L1		45%		20%		-25%

For example, a comparative analysis of specific questionnaire items indicated:

- A 35–40% increase in students choosing more accurate comprehension-related responses.
- Reduced reliance on literal translations and an increased focus on understanding context and meaning.
- A positive shift in learners' reported confidence and emotional responses to reading tasks.

Mind Map Analysis:

A thematic comparison of learners' pre- and post-intervention mind maps revealed significant cognitive restructuring. The pre-test mind maps were predominantly linear, superficial, and disconnected, often limited to isolated vocabulary or a surface-level understanding. In contrast, the post-test mind maps exhibited deeper processing, characterized by:

- More hierarchical structures demonstrating main and sub-ideas.
- Clearer logical sequencing and connections among textual elements.
- The use of color, symbols, and associative branches, indicating enhanced comprehension and engagement with the text.

Students who initially found it challenging to identify relationships between ideas began to incorporate meaningful connections between cause-effect, sequence, and thematic elements following the intervention. This evolution suggested not only improved comprehension but also an increasing metacognitive awareness of their information processing and organization while reading.

Qualitative Findings (Observations):

Observational data confirmed heightened classroom engagement, reduced reading anxiety, and more strategic behavior during reading tasks. Learners displayed a greater willingness to participate, ask questions, and tackle inference-based tasks.

These findings support the conclusion that NLP strategies did not operate in isolation but rather synergistically enhanced cognitive, emotional, and strategic dimensions of reading.

Summary of Findings:

The integrated application of NLP and mind mapping significantly influenced learners' abilities to comprehend, organize, and retain reading material. Quantitative improvements in reading performance were complemented by qualitative evidence of increased learner confidence, enhanced mental clarity, and greater engagement with texts. The post-test mind maps and learner feedback strongly indicated a positive transformation in students' approaches to and processing of reading tasks.

Conclusion

Thorough analysis of pre-test and post-test results clearly indicates significant progress in students' reading comprehension abilities following the focused six-week intervention. The statistically significant enhancements observed across all assessed areas—particularly a notable 23% increase in vocabulary acquisition and a 42% improvement in inferential reasoning skills—provide substantial empirical evidence for the effectiveness of the instructional strategies implemented. The parallel passage design, which employed

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comparable Lexile-level texts on bioluminescence across different contexts, served as a highly valid measurement tool, revealing both skill transfer capabilities and areas necessitating further development.

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