

THE IMPACT OF COGNITIVE LEARNING STRATEGIES ON ENGLISH LANGUAGE ACQUISITION AMONG ADULT LEARNERS IN PUNJAB, PAKISTAN

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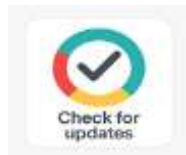
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Abstract

Keyword:

Cognitive learning strategies; English language acquisition; adult learners; TESL; metacognitive strategies; second language acquisition; Pakistan

English language proficiency is increasingly recognized as a prerequisite for academic achievement, professional advancement, and global participation, particularly in multilingual countries such as Pakistan. Despite years of formal English instruction, many adult learners continue to experience difficulties in achieving communicative competence. This study investigates the influence of cognitive learning strategies on English language acquisition (ELA) among adult learners enrolled in Teaching English as a Second Language (TESL) programmes across Punjab, Pakistan. Guided by Krashen's Input Hypothesis, Vygotsky's Sociocultural Theory, and MacWhinney's Competition Model, the study adopts a quantitative, non-experimental correlational research design. Data were collected from 110 adult TESL learners using a structured questionnaire adapted from established language learning strategy instruments. The collected data were analysed using the Statistical Package for the Social Sciences (SPSS) through descriptive statistics, Pearson correlation, and multiple regression analyses. The findings indicate that cognitive learning strategies significantly influence English language acquisition. Among the examined strategies, metacognitive strategies emerged as the strongest predictor of language acquisition, followed by inferencing, rehearsal, and memory strategies. Furthermore, cognitive strategy use demonstrated positive relationships with learners' fluency, accuracy, comprehension, and confidence. The findings support contemporary theories of second language acquisition by highlighting the critical role of learner autonomy, strategic engagement, and self-regulated learning in adult language development. This study contributes empirical evidence from an under-researched TESL context in Pakistan and provides practical implications for TESL practitioners, curriculum developers, educational policymakers, and future researchers seeking to enhance English language learning through strategy-based instruction.



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Introduction

English has become the dominant international language for education, scientific communication, technology, business, and global mobility. Consequently, English language proficiency is increasingly regarded as an essential competency for academic success and professional competitiveness across both developed and developing countries. Although English functions as an official language in Pakistan and serves as the principal medium of instruction in higher education, many learners continue to demonstrate inadequate levels of communicative competence despite prolonged formal exposure to English language instruction (Mahboob, 2020).

The challenge is particularly evident among adult learners enrolled in Teaching English as a Second Language (TESL) programmes in Punjab, Pakistan. While these learners possess greater cognitive maturity, analytical reasoning, and self-regulatory abilities than younger learners, they often experience limited opportunities for authentic English communication outside formal educational settings. This restricted exposure reduces opportunities for meaningful language practice and increases dependence on teacher-centred instructional approaches that emphasise grammar translation and rote memorisation rather than communicative competence. As a result, many adult learners continue to struggle with fluency, comprehension, confidence, and accurate language production despite years of English instruction.

Recent developments in second language acquisition (SLA) research suggest that successful language learning depends not only on instructional methods but also on learners' active use of cognitive learning strategies. Cognitive strategies enable learners to process, organise, store, retrieve, and apply linguistic knowledge through deliberate mental activities such as memory, rehearsal, inferencing, and metacognitive regulation. These strategies promote deeper cognitive processing, learner autonomy, and self-regulated learning, thereby facilitating more effective language acquisition (Krashen, 1982; Vygotsky, 1978; MacWhinney, 2017).

Despite extensive international research examining cognitive learning strategies, empirical evidence from Pakistan remains limited, particularly within adult TESL contexts. Existing studies have largely focused on teaching methodologies rather than investigating how learners employ cognitive strategies to facilitate English language acquisition. Consequently, little is known about the relative contribution of different cognitive strategy domains including memory, rehearsal, inferencing, and metacognitive strategies to English language acquisition among adult learners in Punjab.

To address this gap, the present study investigates the relationship between cognitive learning strategies and English language acquisition among adult learners enrolled in TESL programmes across Punjab, Pakistan. Specifically, the study examines the frequency of cognitive strategy use, evaluates the collective influence of cognitive strategies on English language acquisition, and determines the individual predictive effects of memory, rehearsal, inferencing, and metacognitive strategies on learners' fluency, accuracy, comprehension, and confidence. By providing empirical evidence from an underrepresented educational context, this study contributes to the growing body of literature on second language acquisition while offering practical recommendations for TESL practitioners, curriculum developers, and educational policymakers seeking to enhance English language teaching through strategy-based instruction.

Research Objectives

To examine the influence of cognitive learning strategies on English language acquisition among adult learners enrolled in TESL programmes in Punjab, Pakistan.

Specifically, the study sought to:

1. Identify the cognitive learning strategies most frequently employed by adult TESL learners in Punjab, Pakistan.
2. Examine the relationship between cognitive learning strategies and English language acquisition among adult TESL learners.
3. Determine the predictive effects of memory, rehearsal, inferencing, and metacognitive strategies on English language acquisition.

Significance of Study

The present study contributes to the growing body of knowledge on second language acquisition by providing empirical evidence on the influence of cognitive learning strategies among adult learners in Pakistan, a context that has received relatively limited scholarly attention. While previous studies have examined language learning strategies in different educational settings, comparatively little research has investigated how specific cognitive learning strategies collectively and individually influence English language acquisition among adult TESL learners within multilingual learning environments. From a theoretical perspective, the study extends existing literature by integrating Krashen's Input Hypothesis, Vygotsky's Sociocultural Theory, and MacWhinney's Competition Model to explain how cognitive learning strategies facilitate English language acquisition. The findings enhance understanding of learner-centred approaches to language learning and provide evidence supporting the importance of strategic cognitive engagement in second language development. Practically, the findings provide useful insights for TESL educators, curriculum developers, higher education institutions, and policymakers. The study highlights the importance of incorporating strategy-based instruction into English language classrooms by encouraging learners to develop planning, monitoring, inferencing, and self-regulatory skills. Such practices may improve learner autonomy and English language proficiency while informing curriculum development and teacher professional development programmes across higher education institutions in Pakistan.

Literature Review

Second language acquisition (SLA) has evolved from viewing language learning as a passive process of knowledge accumulation to recognising it as an active cognitive process in which learners consciously construct linguistic competence through strategic mental engagement. Contemporary SLA research suggests that successful language acquisition depends not only on instructional practices but also on learners' ability to process, organise, monitor, and retrieve linguistic information effectively (Krashen, 1982; Vygotsky, 1978; MacWhinney, 2017). Within adult Teaching English as a Second Language (TESL) contexts, cognitive learning strategies have therefore become increasingly important because adult learners rely more heavily on deliberate and self-regulated learning than younger learners, who often benefit from implicit language acquisition.

Cognitive learning strategies encompass deliberate mental processes that facilitate comprehension, retention, retrieval, and application of language knowledge. Among the most frequently investigated strategies are memory, rehearsal, inferencing, and metacognitive regulation. These strategies collectively enhance learners' ability to transform linguistic input into meaningful communicative competence by strengthening vocabulary retention, grammatical awareness, reading comprehension, oral fluency, and learner confidence. Previous empirical studies consistently demonstrate that strategic learners outperform their peers in various dimensions of English language proficiency because they actively regulate their own learning processes rather than depending solely on classroom instruction.

Memory strategies enable learners to encode and retrieve new linguistic information through techniques such as semantic association, imagery, categorisation, and repeated exposure. These strategies are particularly valuable in low-exposure English learning environments where opportunities for authentic communication remain limited. Adult learners who systematically recycle vocabulary and grammatical structures are more likely to achieve long-term retention and improved language performance than learners relying exclusively on short-term memorisation. Likewise, rehearsal strategies promote language automatization through repeated oral and written practice, allowing learners to produce English more fluently while reducing cognitive processing demands during communication. Existing research indicates that regular rehearsal strengthens both pronunciation accuracy and communicative confidence, particularly among adult learners with limited opportunities for natural language interaction.

Inferencing represents another essential cognitive process through which learners construct meaning by integrating contextual information with prior knowledge. Rather than translating unfamiliar vocabulary directly

into the first language, learners employing inferencing strategies actively predict meaning from linguistic and situational cues. This approach supports deeper comprehension while encouraging greater learner autonomy. In multilingual educational contexts such as Punjab, inferencing has been recognised as an effective strategy for overcoming vocabulary limitations and improving reading and listening comprehension without excessive dependence on translation. Similarly, metacognitive strategies—including planning, monitoring, and self-evaluation allow learners to regulate their learning behaviours, identify weaknesses, and modify learning approaches according to task demands. Numerous studies have identified metacognitive regulation as one of the strongest predictors of second language achievement because it coordinates the effective use of other cognitive strategies throughout the learning process.

The present study is theoretically grounded in three complementary perspectives that collectively explain adult English language acquisition. Krashen's Input Hypothesis proposes that language acquisition occurs when learners receive comprehensible input slightly beyond their current level of proficiency ($i + 1$), provided that emotional barriers remain low. Within this framework, cognitive strategies such as inferencing and rehearsal enable learners to process increasingly challenging linguistic input, particularly in low-exposure environments where authentic English interaction is limited. Vygotsky's Sociocultural Theory further emphasises that learning develops through social interaction and instructional scaffolding. Rather than functioning as an independent determinant of learning outcomes, classroom instruction serves as a mediational mechanism that activates learners' cognitive engagement through collaborative activities, guided practice, and meaningful feedback. Finally, MacWhinney's Competition Model explains language acquisition as a process of selecting appropriate linguistic cues through repeated cognitive processing. Together, these theories provide a comprehensive explanation of how instructional support facilitates strategic cognitive processing, ultimately leading to improved English language acquisition among adult learners.

Although extensive international literature confirms the effectiveness of cognitive learning strategies in second language acquisition, empirical evidence from Pakistan remains comparatively limited. Most previous investigations conducted within Pakistani TESL contexts have primarily examined instructional methodologies, teacher practices, or curriculum implementation, while relatively few studies have focused on the cognitive mechanisms through which adult learners actively regulate their own language learning. Furthermore, limited research has simultaneously examined memory, rehearsal, inferencing, and metacognitive strategies as integrated predictors of English language acquisition among adult TESL learners in Punjab. This gap restricts current understanding of how individual cognitive strategy domains contribute to learners' fluency, accuracy, comprehension, and confidence within resource-constrained educational environments.

Accordingly, the present study conceptualises cognitive learning strategies as the principal explanatory mechanism underlying English language acquisition, while instructional practices are treated as contextual enablers that facilitate the effective use of these strategies. Based on this framework, the study investigates the collective and individual influence of memory, rehearsal, inferencing, and metacognitive strategies on adult learners' English language acquisition in TESL institutions across Punjab, Pakistan. This integrated perspective extends existing SLA research by positioning learner cognition, rather than instructional technique alone, as the primary driver of successful language development.

Methodology

This study employed a quantitative, non-experimental correlational research design to examine the influence of cognitive learning strategies on English language acquisition among adult learners enrolled in Teaching English as a Second Language (TESL) programmes in Punjab, Pakistan. A correlational approach was considered appropriate because the study sought to investigate the relationships between cognitive learning strategies and English language acquisition without manipulating the study variables. The research was conducted within the positivist paradigm, emphasising objective measurement and statistical analysis to examine the proposed relationships.

The target population comprised adult learners aged 18–21 years enrolled in TESL programmes across selected higher education institutions in Punjab. A stratified random sampling technique was employed to ensure adequate representation of learners from different institutions. A total of 120 questionnaires were distributed, of which 110 were completed and returned, yielding a response rate of 91.7%, which was considered adequate for statistical analysis.

Data were collected using a structured questionnaire consisting of two sections. The first section measured cognitive learning strategies across four dimensions, namely memory, rehearsal, inferencing, and metacognitive strategies, while the second section measured English language acquisition in terms of learners' perceived fluency, comprehension, accuracy, and confidence. The instrument was adapted from established language learning strategy scales and was reviewed to ensure its suitability for the TESL context. Prior to the main study, a pilot test was conducted to assess the reliability and validity of the instrument. Ethical approval was obtained, and respondents participated voluntarily after providing informed consent. Confidentiality and anonymity were maintained throughout the study.

The collected data were analysed using IBM SPSS Statistics Version 29. Descriptive statistics were employed to identify the cognitive learning strategies most frequently used by the respondents. Pearson correlation analysis was performed to examine the relationships between cognitive learning strategies and English language acquisition, while multiple regression analysis was conducted to determine the predictive effects of memory, rehearsal, inferencing, and metacognitive strategies on English language acquisition. Statistical significance was established at the 0.05 level

Findings

The findings revealed that cognitive learning strategies significantly contributed to English language acquisition among adult TESL learners in Punjab, Pakistan. Among the four strategy domains, metacognitive strategies recorded the highest mean score ($M = 4.18$), indicating that learners relied primarily on planning, monitoring, and evaluating their own learning. Inferencing strategies ranked second ($M = 3.91$), followed by rehearsal strategies ($M = 3.67$), while memory strategies recorded the lowest mean score ($M = 3.42$). These findings suggest that adult learners preferred higher-order self-regulatory strategies over memorisation-based learning approaches.

Table 1. Mean Scores of Cognitive Learning Strategies

Cognitive Learning Strategy	Mean
Metacognitive Strategies	4.18
Inferencing Strategies	3.91
Rehearsal Strategies	3.67
Memory Strategies	3.42

Relationship between Cognitive Learning Strategies and English Language Acquisition

Pearson correlation analysis indicated statistically significant positive relationships between each cognitive learning strategy and English language acquisition ($p < .001$). Metacognitive strategies demonstrated the strongest relationship with English language acquisition ($r = .727$), followed by inferencing strategies ($r = .688$), memory strategies ($r = .637$), and rehearsal strategies ($r = .627$). These findings indicate that learners who frequently employed cognitive learning strategies generally demonstrated better English language acquisition outcomes.

Table 2. Correlation between Cognitive Learning Strategies and English Language Acquisition

Strategy	r	p-value
Memory	.637	< .001
Rehearsal	.627	< .001

Inferencing	.688	< .001
Metacognitive	.727	< .001

Predictive Effects of Cognitive Learning Strategies

Multiple regression analysis was performed to determine the extent to which the four cognitive learning strategies predicted English language acquisition. The regression model was statistically significant ($F = 44.233$, $p < .001$) and explained 62.8% of the variance in English language acquisition ($R = .792$, $R^2 = .628$, Adjusted $R^2 = .613$). These findings indicate that cognitive learning strategies collectively exert a substantial influence on English language acquisition among adult TESL learners.

Among the predictor variables, metacognitive strategies emerged as the strongest predictor of English language acquisition, followed by inferencing, rehearsal, and memory strategies. Overall, the findings suggest that learners who actively plan, monitor, evaluate, and regulate their learning achieve higher levels of English language acquisition than those who rely primarily on lower-order cognitive learning strategies.

Table 3. Multiple Regression Analysis

Model	Value
R	.792
R²	.628
Adjusted R²	.613
F	44.233
p-value	< .001

Summary of Hypothesis Testing

The statistical analyses supported all of the proposed hypotheses. The findings confirmed that cognitive learning strategies significantly influence English language acquisition and that memory, rehearsal, inferencing, and metacognitive strategies each contribute positively to learners' English language acquisition.

Discussion

The present study examined the influence of cognitive learning strategies on English language acquisition among adult TESL learners in Punjab, Pakistan. The findings confirmed that cognitive learning strategies significantly contributed to learners' English language acquisition, supporting the theoretical assumption that strategic learning behaviours enhance second language development. Previous research has consistently demonstrated that successful language learners do not rely only on exposure to the target language but actively employ various strategies to process, retain, and apply linguistic knowledge (Oxford, 1990; O'Malley & Chamot, 1990; Cohen, 2014). Recent research has further highlighted that strategic competence is an essential component of second language learning because it promotes learner autonomy, self-regulation, and effective engagement with language tasks (Oxford, 2017; Griffiths, 2018).

The findings revealed that metacognitive strategies received the highest mean score ($M = 4.18$), indicating that adult TESL learners primarily relied on planning, monitoring, and evaluating their learning processes. This finding is consistent with previous studies emphasizing the central role of metacognitive awareness in successful language learning (Wenden, 1998; Vandergrift & Goh, 2012). Learners who are able to identify their learning goals, monitor their progress, and evaluate their performance are more likely to develop independent learning abilities and achieve better language outcomes (Rahimi & Katal, 2012; Teng, 2020). Similarly, Zhang and Zhang (2022) reported that metacognitive strategy use positively influences learners' self-regulation and second language achievement. The dominance of metacognitive strategies in the present study may be attributed to the characteristics of adult learners, who generally possess greater learning experience and awareness of their individual strengths and weaknesses.

Inferencing strategies ranked second among the cognitive strategies ($M = 3.91$) and demonstrated a strong relationship with English language acquisition ($r = .688$). This finding supports previous research suggesting that inferencing enables learners to construct meaning by combining contextual information, prior knowledge, and linguistic clues (Nation, 2001). Nassaji (2003) found that successful language learners frequently use inferencing strategies to compensate for incomplete linguistic knowledge, particularly during reading and vocabulary learning activities. Similarly, Pulido (2007) highlighted that learners' ability to infer meaning from context contributes significantly to vocabulary development and comprehension. The significant contribution of inferencing strategies in the current study indicates that adult TESL learners actively engage in deeper cognitive processing rather than depending exclusively on direct instruction or translation-based approaches.

The findings further indicated that rehearsal strategies had a positive association with English language acquisition ($r = .627$). Although rehearsal strategies demonstrated a lower mean score ($M = 3.67$) compared with metacognitive and inferencing strategies, their significant contribution confirms the importance of repetition and practice in language learning. This finding corresponds with Schmitt (2000), who argued that repeated exposure and practice facilitate vocabulary acquisition and strengthen memory retrieval. Similarly, Nation (2013) emphasized that sufficient repetition is necessary for learners to achieve automaticity and develop greater language fluency. Webb (2007) also found that repeated encounters with language items improve learners' ability to recognize and use newly acquired vocabulary effectively. Therefore, the current findings suggest that rehearsal strategies remain valuable, particularly when combined with higher-level cognitive strategies.

Memory strategies recorded the lowest mean score among all strategy domains ($M = 3.42$); however, they still showed a significant positive relationship with English language acquisition ($r = .637$). This finding indicates that although adult learners may prefer more analytical and self-regulated approaches, memory-based techniques continue to support language development. Previous research has identified memory strategies, including association, grouping, imagery, and mental connections, as effective methods for improving retention and retrieval of language information (Oxford, 1990; Gu & Johnson, 1996). Furthermore, Karpicke and Roediger (2008) demonstrated that retrieval-based learning activities enhance long-term memory development. The relatively lower preference for memory strategies in this study may reflect a shift from traditional memorization approaches towards more meaningful and strategic learning practices among adult learners.

The correlation analysis demonstrated significant positive relationships between all cognitive learning strategies and English language acquisition ($p < .001$). Among the strategies, metacognitive strategies showed the strongest correlation ($r = .727$), followed by inferencing, memory, and rehearsal strategies. These findings support earlier research indicating that learners who actively manage their cognitive processes generally demonstrate stronger language performance (O'Malley & Chamot, 1990; Oxford, 1990). Similar findings have been reported in recent studies, where strategic awareness and self-regulated learning were identified as significant factors influencing second language achievement (Teng, 2020; Zhang & Zhang, 2022). The strong relationship between strategy use and language acquisition suggests that cognitive strategies function as important mechanisms through which learners improve their linguistic competence.

The regression analysis further revealed that cognitive learning strategies significantly predicted English language acquisition, explaining 62.8% of the variance. Among all predictors, metacognitive strategies emerged as the strongest predictor, followed by inferencing, rehearsal, and memory strategies. This finding reinforces previous theoretical and empirical evidence that strategic learning behaviours contribute substantially to second language success (Cohen, 2014; Oxford, 2017). Learners who actively plan, monitor, and regulate their learning are better positioned to overcome linguistic challenges and achieve higher proficiency levels. The strong predictive effect found in this study highlights the importance of integrating cognitive strategy instruction into TESL classrooms, particularly for adult learners who benefit from developing greater awareness of their own learning processes. Overall, the findings demonstrate that cognitive learning strategies play a significant role in facilitating English language acquisition among adult TESL learners. The results extend previous research by highlighting the particularly strong influence of metacognitive strategies within the Pakistani TESL context. These findings suggest that language educators should move beyond traditional language teaching methods and incorporate strategy-based instruction that encourages learners to become more autonomous, reflective, and actively engaged in their learning processes.

Discussion

This discussion is organized around the three themes identified in the findings, directly addressing the study's single research objective of examining how transformational leadership and financial management contribute to organizational performance.

Theme 1 highlighted transformational leadership as a values-based driver of performance. Consistent with contemporary leadership scholarship (Banks et al., 2022; Moynihan et al., 2021), the findings demonstrate that ethical role modelling and inspirational visioning foster trust, engagement, and discretionary effort among staff. In TAPeM, leadership practices shaped how employees interpreted their roles, transforming routine administrative tasks into mission driven activities. This supports the argument that transformational leadership enhances performance by embedding organizational values into everyday practices rather than relying solely on formal authority.

Theme 2 emphasized financial management as an accountability and sustainability mechanism. The findings align with public management literature that positions financial governance as central to organizational legitimacy and performance (Van Dooren et al., 2021; Pollitt & Bouckaert, 2023). Importantly, the study shows that financial controls are most effective when staff understand their purpose. Financial management, therefore, functions not only as a technical system of control but also as a socially constructed process shaped by organizational meaning and leadership communication.

Theme 3 demonstrated the integrative role of transformational leadership and financial management in shaping organizational performance. By framing financial accountability as a moral and organizational responsibility, leaders aligned financial discipline with TAPeM's social mission. This integration supports governance perspectives that view leadership and control systems as complementary mechanisms (Van der Voet & Steijn, 2021; Kroll & Vogen, 2021). The findings suggest that organizational performance in education trust institutions emerges from this alignment, rather than from leadership or financial management in isolation (Manurung, 2025). This finding aligns with recent studies that conceptualize transformational leadership as an enabling governance force that strengthens the effectiveness of financial control systems and enhances organizational legitimacy (Breevaart & Zacher, 2023; Van Helden & Uddin, 2024).

This study advances management scholarship by extending transformational leadership theory into the domain of public-sector financial governance. It demonstrates that transformational leadership functions not only as a behavioral influence mechanism but also as a governance-enabling force that shapes how financial accountability systems are enacted and internalized. By integrating leadership and financial management, the study offers a refined explanation of how public organizations achieve sustainable performance under fiscal constraint. The findings suggest that leadership development programme in public agencies should incorporate financial literacy, while financial managers should be encouraged to adopt transformational communication strategies. Aligning mission-driven leadership with financial accountability can strengthen organizational sustainability and legitimacy. These findings resonate with recent public-sector governance research which argues that leadership enhances the effectiveness of financial control systems by embedding accountability within

organizational values and shared meaning structures (Bracci et al., 2023; Van Helden & Uddin, 2024). By framing financial discipline as a moral and mission-driven responsibility, transformational leaders strengthen organizational legitimacy and performance outcomes, particularly in education-based public trust institutions (George et al., 2023; Van der Wal & Demircioglu, 2024).

Conclusion

This study examined the influence of cognitive learning strategies on English language acquisition among adult learners enrolled in TESL programmes in Punjab, Pakistan. The findings demonstrate that cognitive learning strategies significantly influence English language acquisition and that learners who actively regulate their learning achieve stronger language outcomes. Among the four cognitive learning strategy domains, metacognitive

strategies emerged as the most frequently employed and the strongest predictor of English language acquisition, followed by inferencing, rehearsal, and memory strategies. The regression analysis further confirmed that cognitive learning strategies collectively explained a substantial proportion of the variance in English language acquisition, highlighting their importance in adult second language learning.

The study contributes to the existing TESL literature by providing empirical evidence from the Pakistani context, where research examining the influence of cognitive learning strategies among adult learners remains limited. The findings also support the theoretical propositions of Krashen's Input Hypothesis, Vygotsky's Sociocultural Theory, and MacWhinney's Competition Model by demonstrating that successful English language acquisition depends not only on language exposure but also on learners' ability to process, regulate, and apply cognitive learning strategies effectively.

The findings have important implications for English language educators, curriculum developers, and policymakers. Strategy-based instruction should be integrated into TESL programmes to encourage learners to develop planning, monitoring, inferencing, reflective learning, and self-regulatory skills. Such instructional approaches have the potential to improve learner autonomy and English language proficiency while enhancing the quality of English language education within higher education institutions in Pakistan.

Practical Implications

The findings suggest that higher education institutions should place greater emphasis on strategy-based language instruction by incorporating cognitive learning strategies into English language curricula. TESL educators should explicitly teach learners how to plan, monitor, evaluate, and regulate their own learning through metacognitive activities while simultaneously encouraging inferencing, rehearsal, and memory techniques that support long-term language development. Curriculum developers should integrate learner-centred activities that foster independent learning, whereas policymakers should strengthen teacher professional development programmes to equip educators with the knowledge and skills necessary to implement strategy-based instruction effectively. Such initiatives are expected to improve English language acquisition and contribute to the development of more autonomous and proficient English language learners.

Limitations of the study

Although the present study contributes valuable insights into the relationship between cognitive learning strategies and English language acquisition, several limitations should be acknowledged. First, the study focused exclusively on adult learners enrolled in TESL programmes within selected institutions in Punjab, thereby limiting the generalisability of the findings to other educational contexts. Second, the use of a cross-sectional research design restricted the investigation to relationships observed at a single point in time. Third, the reliance on self-reported questionnaire data may have introduced response bias.

Recommendations for Future Research

Future research could expand this study in several ways:

- I. Future studies should employ longitudinal or experimental research designs to investigate how cognitive learning strategies develop over time and influence language acquisition.
- II. Comparative studies involving learners from different provinces, educational levels, or countries would provide broader insights into contextual influences on cognitive learning strategies.
- III. In addition, future researchers may incorporate variables such as motivation, language anxiety, digital learning environments, and learner autonomy to develop a more comprehensive understanding of English language acquisition among adult learners.

Co-Author Contribution

The authors declare that there are no financial, professional, or personal conflicts of interest that could have influenced the conduct of this study or the interpretation of its findings.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Data Availability Statement: All relevant data are within the manuscript and its [Supporting Information](#) files.