



INTERNATIONAL JOURNAL OF EDUCATION AND PEDAGOGY (IJEP)

(Open Access, Double-Blind Peer Reviewed Journal)

ISSN Online: 3108-1800

ISSN Print: 3139-454X



Cognitive and Compensation Language Learning Strategies as Predictors of Academic Performance of the ESL Learners at graduation level

Joby Cyriac

Assistant Professor, Marian college Kuttikkanam, Autonomous, Kerala, India.

Article information

Received: 3rd June 2026

Received in revised form: 7th June 2026

Accepted: 20th June 2026

Available online: 9th July 2026

Volume: 2

Issue: 3

DOI: <https://doi.org/10.63090/IJEP/3108.1800.0035>

Abstract

An exploration of the ways in which such motivations of learners are mediated in English for Academic purposes classrooms at tertiary level is important to explain differences in academic achievement between ESL learners at the undergraduate university level. Although language-learning strategies have been extensively researched, empirical data concerning the predictive validity of individual-strategy type categories in tertiary educational settings are still scarce. The current study explores the association between cognitive language learning strategy and compensation language learning strategy, and English achievement of undergraduate students as well. Quantitative, cross-sectional correlational design was used and data were from 87 undergraduate ESL learners through an adapted version of the Strategy Inventory for Language Learning, with academic achievement being reflected by their institutional English subject marks. Associations and predictive patterns were analyzed using Pearson correlation/ regression analyses. Results suggest that practising-related cognitive strategies, and intelligent guess as a compensatory strategy are significantly positively related to academic performance, not other STRATEGY components. Demographic factors have only marginal explanatory power as compared with strategic language use. The results indicate selective and context-dependent nature of language learning strategies, and the efficacy of targeted strategic involvement in contributing to academic performance on English. The findings provide context-specific insight to LLS (Language Learning Strategy) research and have implications for strategy-conscious pedagogy in undergraduate ESL.

Keywords:- Language learning strategies, Cognitive strategies, Compensation strategies, Academic performance, ESL learners, Higher education

I. INTRODUCTION

English has evolved into an absolute academic and professional necessity in higher education environments where English is the medium of instruction. In tertiary education, domestic onshore ESL students' academic achievement involves the ability to interact well in English – for a range of texts including reading and interpretation, written work (assignments or exams), oral presentations etc. Despite similar amounts of instructional time, learners frequently display wide variability in academic achievement, suggesting that factors beyond curriculum and pedagogy are influential on learning outcomes.

Use of language learning strategies is one of the most frequently investigated learner-related variables in SLA research. “Strategies,” as applied to the learning of a language, are defined as the “use of tactics or techniques by learners themselves” (Chamot & Kupper, 1989:19) and “conscious plans for making progress in developing language skills” (Oxford, 1990:5). Research in the past decades has constantly shown that successful foreign/second language (L2) learners are more strategic, flexible and self-regulated compared to less successful ones (Ehrman & Oxford, 1990; Hong-Nam & Leavell, 2006).

In the bigger scheme of language learning strategies, cognitive and compensation strategies are key factors. Cognitive strategies are those that involve direct manipulation and transformation of the language, as in practicing, reasoning, summarizing, analyzing and structuring information (Chamot & Kupper 1989). These tactics help students actively process language, link new knowledge with previous knowledge and develop meaning by being consciously engaged with the linguistic data. An understanding of compensation can help learners cover for gaps in their language knowledge by guessing the words (or using other words) to arrive at meaning, taking advantage of context, or realizing the support from others they

had overlooked like nonverbal signals (Oxford, 1990; Ahmad & Ismail, 2013). These strategies, combined, help to allow learners to remain communicatively effective even before full linguistic ability is reached.

The importance of language learning strategies for language proficiency and academic achievement was demonstrated in numerous studies. Studies have found that ESL and EFL students who report using cognitive and compensation strategies consistently show higher levels of language proficiency, enhanced communicative confidence, and an increase in academic success (Foong & Goh, 1997; Uslu et al., 2016; Habók & Magyar, 2018). Yet results across studies are not uniform, particularly concerning which particular strategies have the greatest impact on academic achievement. Although some studies claim that strategic language use accounts for variation in second-language (L2) achievement, they also show that this relationship might be contingent upon contextual, instructional or learner-related factors (Modu et al., 2010; Hong-Nam & Leavell, 2006).

One shortcoming in the literature that is worth noting, however, is a strong preponderance to view language learning strategies descriptively with emphasis on frequency of use and rather than as predictors of academic measures. Moreover, strategy use is often investigated as an overall construct and not in terms of the contribution of particular strategies (e.g., cognitive or compensation strategies). Such a gap noticeable specifically in tertiary level: ESL good users/performers contexts within Indian HEI where English serves as an essential academic language, but the systematic empirical studies of strategy–performance connection still keep confined.

In addition, despite the fact that demographic factors such as gender, L1 and educational background are widely surveyed in studies on language learning, they have been considered separately from strategy use. Thus, the extent to which cognitive and compensatory strategies exert independent associations with academic achievement—beyond what is explained by basic demographic variables—is under-researched. It is relevant to fill this gap, not only for a better theoretical comprehension of language learning strategies but also to guide pedagogical practices in the field of learner autonomy and strategic competence.

In this context, the aim of the current study was to investigate the correlation between cognitive and compensation strategies for language learning and academic performance in English among ESL undergraduates. The study does not take its position to lecturer cause or effect but takes one of prediction and association as it seeks to ascertain whether to the extent at which these strategy types relate to learners’ academic results. By targeting undergraduate students in the particular setting, this study adds context-sensitive data to the larger conversation about language learning strategy use in higher education.

The practical contributions that this study can make to educators are further anticipated in reporting the strategic behaviors that most closely relate to academic success in English. At tertiary level, it also seeks to add to the literature in terms of clarifying how strategy–performance relationships function within ESL settings so that more principled and learner-focused language teaching can be promoted.

II. THEORETICAL BACKGROUND AND LITERATURE REVIEW

2.1. Language Learning Strategies: Theoretical Foundations

Since their emergence, language learning strategies (LLS) have been considered an important explanatory factor in research on second language acquisition (SLA), especially when investigating interindividual variation. In general terms, language learning strategies are the conscious and semi-conscious thoughts, behaviors and actions learners use to learn a second or foreign language more easily (Chamot & Kupper 1989; Oxford 1990). While methods of teaching are externally controlled, strategies for learning are learner generated and mirror the amount of individual autonomy and self-regulation in learning.

Oxford (1990) suggested one of the most popular models for categorizing language learning strategies, namely the direct (memory, cognitive, and compensation) and indirect (metacognitive, affective, and social) categories. Direct strategies are those which allow the students to work with the target language directly in processing language and producing output, whereas indirect strategy support learning, by regulating one's emotions, motivation and interaction position. This taxonomy has received much attention because of its lucidity, empirical basis and use across ESL and EFL settings.

Research consistently finds that successful learners use a greater variety of strategies more often and in greater depth than do less successful learners (Ehrman & Oxford, 1990; Hong-Nam & Leavell, 2006). Nevertheless, the existence of strategy use does not necessarily dictate successful learning; rather, it seems that whether certain strategies are used strategically and appropriately is what affects learning. As a result, scholars have begun to shift from global strategy checklists to exploring how individual categories of strategies are associated with academic and linguistic achievement.

2.2. Cognitive Language Learning Strategies

Cognitive strategies have been one of the most widely researched group in language learning strategy research. These activities are those which directly manipulate, transform and organize the language material using mental processes such as repetition, reasoning, analysing, summarizing and structured practice (Chamot & Kupper, 1989). The cognitive strategies enable learners to be actively involved in the (receptive) processing of language input, ensuring that it is more deeply processed and better remembered.

Cognitive strategies are found to be involved in both understanding and production of language as evidenced by empirical research. Students who often used different strategies like producing sounds, analyzing sentences, summarizing texts, and relating new information to previous information were found to have higher academic success and proficiency in using language (Zarei & Elekaei, 2013; Mat'ková et al., 2013). These are skills that need working on, especially in an academic environment where students are dealing with more complicated texts and being required to write response or perhaps demonstrate analysis in exams.

However, there is no consensus among them as to the strength of the relationship between cognitive strategies and academic achievement. Whilst studies sometimes find positive relations, the moderating effect of cognitive strategies may

depend on variables like learning context, participants' proficiency, and academic tasks (Modu et al., 2010). This variability indicates that the ways cognitive strategies operate within specific educational environments, particularly at the undergraduate level, need exploration.

2.3. Compensation Language Learning Strategies

Compensatory strategies are used when learners experience a breakdown in their knowledge of the language and have to make do with what they know. These strategies involve inferencing from context, substituting synonyms or giving a paraphrase, using gestures, and depending on linguistic or non-linguistic cues to transmit or get messages across (Oxford, 1990). Instead of being indications of lacks, compensation strategies are the showing signs of strategic competence and communicative flexibility.

Strategies have been found to receive special attention from learners who are functioning in real meaningful settings where optimal linguistics is less possible (Foong and Goh, 1997). Ahmad & Ismail (2013) reported that on the adult ESL learners who used the compensation strategies more successfully were able to maintain interaction, and comprehension when their lexical or grammatical knowledge was incomplete. These strategies lead to more confident academic and social engagement in spoken language, and may have an indirect impact on academic achievement.

As important as these latter issues are, they have not been addressed in nearly as much depth compared to that regarding academic performance. In most of the existing research they are considered used behaviour without thinking about their predictive value to academic performance. Furthermore, the association between compensation strategies and formal academic assessment is somewhat limited, especially in undergraduate-level ESL populations that are frequently assessed by written assignments and more structured tests rather than free oral interaction.

2.4. Language Learning Strategies and Academic Achievement

The association between language learning strategy use and EFL performance has been a focus of attention in the literature. Some studies state that participants who possess strategic consciousness and have more strategies used get better academic results in language-related subjects (Uslu et al., 2016; Habók & Magyar, 2018). These results are consistent with the proposition that learning strategies serve as mediating variables between instruction input and learning outcomes.

Yet, the literature is not consistent. Although, the empirical work indicates that there are strong associations between strategy use and academic performance (Hong-Nam & Leavell, 2006; Modu et al., 2010), some studies revealed weak or nonsignificant relations for certain categories of learning strategies. These inconsistencies could be attributed to variations in the designs of studies, type of measurement tools, and learner groups and contexts.

Recurrent in the research tradition is a propensity to approach strategy use broadly or descriptively and not to investigate the predictive value of specific clusters of strategies. Furthermore, few studies have explored ESL undergraduates in academic contexts where English is used as a medium of assessment. This gap highlights the necessity of specific empirical investigations to investigate how certain categories of strategies (namely, cognitive and compensation strategy) are related to English academic achievement in undergraduate students.

2.5. Positioning the Present Study

Informed by the literature, the current study delineates cognitive and compensation language learning strategies and their impact on academic achievement in English among ESL learners at the undergraduate level. Grounding these strategy types in a specific institutional context, the study advances our understanding beyond descriptives of strategy use and generates predictions as to how strategic language behaviour relates academically. The study thus fills a gap in language learning strategy research and presents context-sensitive data for higher education pedagogy.

III. RESEARCH GAP AND RESEARCH QUESTIONS

Notwithstanding the continued research effort of language learning strategies, there are still a number of unfinished links in the body of literature, particularly in higher education ESL environment. Although a plethora of research has investigated the prevalence and nature of strategies employed by language learners, such work has largely been descriptive in nature focusing on how often learners use certain strategies rather than exploring what if any relationship there is between strategy use and specific academic outcomes (Hong-Nam & Leavell, 2006; Modu et al., 2010). Thus, the causal and predictive characteristics of language learning strategies are not well established.

A second void involves the depth of analysis in previous research. Several studies consider pluralistic language learning strategies as an undifferentiated whole and fail to differentiate the separate roles of each strategy category. Specific, language based cognitive processes and compensation strategies are included in broad strategy checklists without a specific focus on their effect on academic performance (Chamot & Kupper, 1989; Oxford, 1990). This constrains knowledge of what strategic behaviours are most pertinent for English academic achievement.

Third, prior research results are inconclusive with respect to the link between language learning strategies and achievement. Positive relations of strategy use with academic success are found in some studies, whereas weak or non-significant relationship were observed for certain types of strategies (Uslu et al., 2016; Habók & Magyar, 2018). Differences in results obtained among these studies indicate that the relationship between strategy use and performance may be determined by the context such as learner factors, institutional environments, and test conditions. Referring to the often-cited Kahn study (2004), few studies have examined such phenomena in an undergraduate ESL environment where English is both the mode of instruction and assessment.

In addition, very little study has been carried out in Indian higher education institutions where English plays a key role in academic examination and advancement. Moreover, the low incidence of institutional undergraduate ESL research restricts

the contextual applicability of current findings and highlights the necessity for empirical studies embedded within local educational environments (Modu et al., 2010).

To fill this gap, the study investigates cognitive and compensation language learning strategies as well as their relationship with academic performance in English by undergraduate ESL students. Adopting a predictive-associative approach, the study aims to provide context-bound information that further informs our understanding of strategy-performance links in higher education.

3.1. Research Questions

The following research questions were formulated based on the identified gaps.

- What is the extent of correlation between cognitive language learning strategies and academic success in English among ESL undergraduates?
- Are there any notable correlation between compensation learning strategies and the academic achievement in English of the undergraduate ESL students?
- How much do cognitive and compensation language learning strategies predict English academic achievement?

VI. METHODOLOGY

Research Design: The present study is a quantitative, cross-sectional and correlational research conducted to investigate the relationship between language learning strategies and academic achievement in English among undergraduate ESL learners. Correlational design is suitable in this study, as it permits the examination of associations and predictive relationships among variables without inferring causality. This approach coincides with prior empirical studies in LLS research where strategy use reported by learners is analysed in relation to academic or proficiency-related achievements (Hong-Nam & Leavell, 2006; Habók & Magyar, 2018).

Participants and Context: The participants were 87 second year undergraduate students of an English medium academic institution who are studying for their degrees. The sample comprised male and female students of different educational experiences, in terms of previous medium of instruction as well as schooling systems. Projection The study subjects were chosen through simple random sampling from the available population, each student having an equal chance of being included in the sample.

The institutional context is a common ESL academic setting in Indian higher education where students have to work with English quite heavily for coursework, assignments and examinations. This environment offers an appropriate setting to explore the relationship between language learning strategies and academic success.

4.1. Tools used for study

Language Learning Strategies Questionnaire: The questionnaire used for this purpose was designed to collect data on strategies that students use for learning and had been based upon a slightly modified version of the Strategy Inventory for Language Learning (SILL) proposed by Oxford (1990). The scales examined in the questionnaire were dedicated to two categories of strategy.

Cognitive strategies such as practising, analysing and reasoning, receiving messages and sending of information by language users, as well as creating structure for input and output.

Compensation devices, such as intelligent guessing and working with reduced speaking and writing.

The scale was constructed from items rated on a Likert-scale from 1 (Never or almost never true of me) to 5 (Always or almost always true of me). Dependent on cognitive and compensation strategies as described in the literature (Chamot & Kupper, 1989; Oxford, 1990), the instrument was developed.

Measurement of Academic Performance: Study performance was assessed with the scores of students in English course (as it has been received from school's reports). Marks were treated as a continuous variable and were the dependent variable in the analysis. The use of institutional-assessment data has the advantage that achievement results are based on objective assessment rather than self-report.

V. DATA COLLECTION PROCEDURE

The questionnaire was performed for the participants in a classroom by informed consent. Participation was anonymous and confidential, and the respondents' participation was on a voluntary basis. Selected questions were asked in English, as all participants had previous experience of learning through the medium of English. Returned questionnaires were checked for completeness before entered into the analysis.

5.1. Data Analysis

Where necessary, analysis was conducted using spreadsheet software and statistical software (SPSS). The analysis went through several stages:

Participants' demographic variables, and in general strategy used were summarized using descriptive statistics.

Pearson product-moment correlation analysis was performed to explore the association of cognitive and compensation strategy variables with English academic achievement.

A *regression analysis* was performed to evaluate the predictive power of the strategy categories with regard to academic performance, where standardized coefficients were used without a causal interpretation.

Between-group differences in strategy use across binary demographic variables (i.e., gender and medium of previous instruction) were analyzed using independent samples t-tests.

One-way ANOVA analyses were performed to examine differences in strategy use with demographic multiple group variables (e.g., previous education curriculum and school location).

Statistical analyses were all evaluated at the 5% level ($p < .05$). The aim was to detect significant associations and tendencies, rather than causal relations, as is appropriate when using correlational study design for the analysis.

VI. ETHICAL CONSIDERATIONS

The principles of ethics were upheld in this study. Participation was voluntary, all participants were given informed consent prior to starting the survey and anonymity of answers was ensured. The data was strictly for academic research purposes.

6.1. Data Analysis

The present section describes the findings of the statistical analyses carried out to determine the relationship between cognitive and compensation language learning strategies and English achievement among ESL undergraduate students. To ensure clarity and brevity, relevant statistical results have been aggregated into thematic tables, consistent with the organization of journal reporting.

6.1.1. Relationship Between Language Learning Strategies and Academic Performance

Table 1. Correlations Between Language Learning Strategies and Academic Performance

Strategy Category	Pearson's r	p-value
Practicing (Cognitive)	.734**	< .001
Receiving & Sending Messages (Cognitive)	-.069	.524
Analyzing & Reasoning (Cognitive)	-.014	.899
Creating Structure for Input-Output (Cognitive)	.025	.821
Guessing Intelligently (Compensation)	.664**	< .001
Overcoming Limitations in Speaking & Writing (Compensation)	.225*	.036

Note. $p < .05$, $p < .01$; $N = 87$.

As shown in Table 1, practicing-related cognitive strategies exhibit a strong positive and statistically significant correlation with academic performance in English ($r = .734$, $p < .01$). This indicates that students who frequently engage in practicing strategies tend to achieve higher academic scores.

Among compensation strategies, guessing intelligently demonstrates a moderate positive correlation with academic performance ($r = .664$, $p < .01$), while overcoming limitations in speaking and writing shows a weak but statistically significant association ($r = .225$, $p < .05$).

In contrast, other cognitive strategy components—receiving and sending messages, analyzing and reasoning, and creating structure for input and output—do not exhibit statistically significant relationships with academic performance ($p > .05$).

6.1.2. Predictive Contribution of Learning Strategies

To further examine the predictive contribution of strategy categories that demonstrated significant correlations, regression analyses were conducted.

Table 2. Regression Analysis Predicting Academic Performance from Learning Strategies

Predictor	Standardized β	t	p
Practicing (Cognitive)	.734	9.97	< .001
Guessing Intelligently (Compensation)	.664	8.20	< .001
Overcoming Limitations (Compensation)	.225	2.13	.036

Dependent Variable: Academic Performance in English

Table 2 indicates that practicing-related cognitive strategies are a strong and statistically significant predictor of academic performance ($\beta = .734$, $p < .001$). Similarly, guessing intelligently emerges as a significant predictor ($\beta = .664$, $p < .001$), highlighting the role of inferencing and adaptive communication strategies in supporting academic achievement.

The strategy of overcoming limitations in speaking and writing also shows a statistically significant, though comparatively weaker, predictive association with academic performance ($\beta = .225$, $p < .05$). These findings suggest that while multiple strategy categories are associated with academic outcomes, their predictive strengths vary substantially.

6.1.3. Demographic Effects

To examine potential group differences, independent samples t-tests and one-way ANOVA were conducted across selected demographic variables.

Table 3. Summary of Demographic Differences in Strategy Use

Demographic Variable	Strategy Showing Significant Difference	p-value
Gender	None	—
Medium of Instruction	Practicing	< .05
Education Syllabus	Practicing	< .05
School Location	None	—

As summarized in Table 3, gender and school location do not show statistically significant differences in the use of cognitive or compensation strategies. However, students with an English-medium educational background and those from different education syllabi demonstrate significant differences in the use of practicing strategies. Overall, demographic variables exhibit limited explanatory power when compared to learning strategy variables in relation to academic performance.

6.1.4. Overview of Results

Collectively, the results indicate that:

- Practicing-related cognitive strategies show the strongest association with academic performance.
- Compensation strategies, particularly guessing intelligently, demonstrate moderate predictive relevance.
- Several cognitive strategy components do not show meaningful relationships with academic achievement.
- Demographic factors play a secondary role compared to strategic language behaviour.

6.2. Discussions

The purpose of the current study was to investigate English language learning strategies including cognitive and compensation strategies for their association with academic achievement among undergraduate ESL learners. The results provide finer-grained information on which strategy categories are generally linked to academic performance and also demonstrate that the efficacy of strategies is selective in school-like environments.

Of note, a strong relationship with academical performance (as assessed by the TOMS-H/FFP) was found for practising-related cognitive strategies. Corpuzzano Learners who were more engaged in practicing activities – repetition, structured use of language forms, and active rehearsal – obtained higher scores in English. This is consistent with the theoretical stance which states that cognitive strategies generate a more comprehensive processing of linguistic input, contributing to better comprehension and retention (Chamot & Kupper, 1989; Oxford, 1990). The use of strategies in practice directly involves learners in the language system and allows them to internalize grammatical structures, vocabulary patterns and discourse styles as they are necessary to school tasks such as reading for meaning or writing.

The predictive power of strategy use found in the present study aligns with previous empirical evidence that has associated high levels of cognitive engagement to successful academic and language performance (Uslu et al., 2016; Habók, Magyar, and Lénárt 2018). In the context of schools, if assessment focus is accuracy, organisation and coherence i.e. practice supported systematic control of language forms could be more relieving. The salience of practice strategies in the current findings also indicates that not all cognitive strategies are equally related to academic performance, pointing out the importance of analysing subcomponents of a strategy rather than treating cognitive strategies as an undifferentiated category.

Receiving and sending, analysing and reasoning and structuring input/output that the other components of cognitive strategy were not correlated with academic achievement. This finding may seem paradoxical, considering the theoretical importance of these strategies for language learning. But such discrepancies have been found in previous research, where some cognitive strategies were context or task specific to be effective (Hong-Nam & Leavell, 2006; Modu et al., 2010). Perhaps these strategies are more related to communication competence or higher levels of language processing than with performance in school-based tests that typically emphasize accuracy and recall of previously learned material.

Results for compensation strategies shed additional light on the flexible nature of strategic language use. The strong relationship between guessing intelligently and school achievement implies that once students understand meaning in context, can guess sensibly by using clues, and fill in missing information, they are better able to negotiate demands of academic language. This result corroborates previous studies which highlight the importance of compensation moves in maintaining kamage (comprehension and communication) within ESL contexts (Foong & Goh, 1997; Ahmad & Ismail, 2013). Smart guessing may enable learners to continue engaging with academic texts and classroom discussion even when complete literal meaning is not available.

Meanwhile, the weaker predictive power of transcending limitations in oral and written expression suggests that not all compensation mechanisms are contributing equally to academic achievement. Although such pedagogies can support oral interactivity and communicative confidence, they may have limited impact on formal academic testing, which tends to focus on written accuracy and standardised responses. This contrast underscores the importance to also take alignment between type of strategy and format of assessment into account when interpreting strategy–performance relations.

In the demographic analyses, we found little evidence that gender or context of learning made much difference to SRS use. It would seem that such demographic factors play a relatively minor role in shaping strategic language behavior in the present population. Differences in the use of strategies regarding medium in which previous instruction took place and education programme, however, suggest that background (in)education could have an effect on learners' strategic repertoires. English-medium learners may be more exposed to having structured intensive language practice which can account their heavy dependence on practicing strategies. Nonetheless, the relatively low R^2 regarding demographic variables further underlines that differences in learning strategies rather than background contribute centrally to the explanation of academic performance.

Collectively, those findings add to the trend in recent literature underscoring the role of strategy specificity in SL research. Rather than assuming increasing strategy varies monotonically with success, this study reveals that only a restricted set of strategies — those most consistent with academic task demands — are robustly linked to performance. This conveys an important pedagogical message that teaching strategies should concentrate more on the quality and relevance of strategy use rather than only striving for a wider range of strategies used.

6.3. Educational Implications

The results of the current study provide some implications for teaching, learning and curriculum of ESL at university level underpinned by in higher education with English as a medium of instruction and assessment.

First, the heavy reliance of practicing-related cognitive strategies on academic performance emphasizes how a proactive and organised engagement with language learning is crucial to succeed in school. This indicates that it is necessary to go beyond presentation-based approaches in instructional practice and include activities which elicit continuous exploitation, rehearsal, and manipulation of language forms. Activities such as modeled writing drills, scaffolded verbal practice, repeated reading tasks and targeted language activities may assist learners in internalizing linguistic patterns more efficiently, which could potentially facilitate better performance on standardized assessments. This implication is consistent with previous research findings about the significance of cognitive involvement in language learning and success (Chamot & Kupper, 1989; Oxford, 1990).

Secondly, the prominent role of guessing as a compensatory strategy illustrates that this is a learning strategy for ESL students who, therefore, need to develop inferencing and contextual reasoning skills. Rather than proscribing guessing as a representation of linguistic poverty, teachers can view it instead as an adaptive learning strategy. Teaching approaches that support learners to infer meaning from context, anticipate content, and tolerate uncertainty might better prepare learners in order to handle complex academic texts and classroom discourse. Previous research has also reported that effective application of compensation strategies promotes continued understanding and communicative interaction in the ESL context (Foong & Goh, 1997; Ahmad & Ismail, 2013).

Conversely, the lack of relations for some cognitive strategies (i.e., analyzing and reasoning, creating input and output structure) supports the conclusion that strategy effectiveness is task-specific. This implies that strategy instruction should not be treated as a uniform intervention. Instead, teachers might be required to adapt strategy instruction to the demands of particular academic tasks and assessment types as well as learner proficiencies. Focusing on strategies that directly enhance assessed outcomes may have greater educational impact than endorsing general strategy use without explicit situational relevance.

The lack of robustness of demographic variables found in the study serves to strengthen the idea that sociodemographic profile is less malleable than strategic behavior. Instructionally, this indicates that learners' academic performance can be enhanced through the facilitation of targeted strategy training regardless of gender and schooling background. As a result, the incorporation of strategy awareness and training into mainstream classroom instruction may offer an egalitarian way of helping ELLs in ESL higher education (Habók & Magyar, 2018).

Lastly, the results bring attention to the possible benefits of integrating strategy awareness training in English undergraduate course work. Otherwise academic independent learning with explicit instruction on successful strategies, reflective activities allowing learners to assess their strategy use and being able to practice strategies in real academic tasks might help foster learner autonomy and self-regulation." These pedagogical interventions coincide with larger educational objectives to produce independent, life-long learners who are able to adjust to diverse academic tasks.

6.4. Limitations and Future Research

Although this study provides useful insights into the role of cognitive and compensation language learning strategies in academic achievement, it is not without limitations that further research should be aware of.

First, the cross-sectional correlational design of the study does not permit drawing causal inferences. Even though substantial correlations and prediction relationships were discovered, the result could not conclude that practicing a learning strategy lead to better performance. The second methodological limitation is that longitudinal designs would be helpful to test how strategy use evolves over time and how consistent (i.e. sustained) strategic activity influences academic outcomes from semester/academic stage to semester/academic stage.

Second, we used a relatively small sample originating from a single institutional environment. Although the sample size was sufficient for statistical analyses, the results may not be easy to generalize to other undergraduate ESL student populations in various institutions, regions or education systems. Future work could improve generalizability by using larger, Multi institution samples with greater diversity in academic fields.

The *third* limitation is that language learning strategies were assessed through a self-report questionnaire, which has the drawbacks of biasing like social desirability and misperception. Learners' actual strategy use may be either overestimated or underestimated, especially for strategies with lower levels of conscious monitoring. It could be improved in future work by triangulating self-report scales with classroom observations, learning diaries or think aloud protocols or digital learning analytics.

Fourth, academic achievement relied on English language marks, which are indicative of one's formal assessment performance but not necessarily communicative skills or proficiency. Various types of assessments (e.g., project-type assessment, oral presentation, task with performance) may interact differently with strategy categories. Potential future research could investigate the extent to which learning strategies intersect with different assessment formats to give a more specific picture of strategy–performance relationships.

Lastly, the analysis did not take into account other types of strategies (i.e., metacognitive, affective and social) despite our focus on cognitive and compensation strategies in this study. These strategies may also have interactions with cognitive and compensation strategies. Future research should explore a more holistic or multivariate approach when considering that several strategy categories can potentially coact in determining academic achievement.

6.5. Directions for Future Research

Bearing this in mind, it could be interesting for future research to explore:

- Using longitudinal or experimental designs to investigate the mediating processes between strategy employment and school achievement.
- Generalizing to a broader sample from multiple campuses and disciplines, thus improving external validity.

- Coupling mixed-method methodologies to capture both the quantitative trends and qualitative insights regarding learners' strategic experiences.
- Investigate the effectiveness of teaching interventions that foster particular learning strategies and their impact on educational achievement.
- Exploring relationships between categories of strategies, instead of treating them separately.
- Considering such concerns will be helpful for future research to better develop theoretical underpinnings of language learning strategies and enhancing pedagogical implications in higher education ESL environments.

VII. CONCLUSION

This study investigated the correlation between cognitive and compensation learning strategies and academic achievement in English at the undergraduate level of ESL learners. This study contributes to a more differentiated understanding of how specific forms of strategic language engagement are associated with academic outcomes in higher education contexts due to its focus on strategies and predictive orientation.

The results show that learning strategies are not equally effective in terms of academic achievement. Of the cognitive strategies, practice-related activities were found to be the most relevant predictor of achievement, which implies that a lot and well-structured exposure to language forms constitutes essential support for formal assessment performance in English. In terms of compensation strategies, intelligent guessing emerged as a significant positive predictor, indicating the relevance of inferencing and adaptive problem-solving when faced with language gaps in an academic setting. Other strategy elements were not significantly associated, emphasizing the selective and context-dependent effectiveness of strategies.

Crucially, these findings demonstrate that strategic language choice has more predictive power than demographic factors such as gender and whether or not a participant had attended school. This supports the assertion that learning strategies are a modifiable and pedagogically sensitive aspect of learner behavior rather than an inherent individual characteristic. Therefore, English academic achievement is not to be viewed as a direct result of background knowledge only; it corresponds directly to how learners participate interactively with language themselves in their learning process.

Theoretically, this study contributes to the LLS literature by calling for more disaggregated research that moves beyond macro-categories and toward a focus on the unique role of particular cluster strategies. Methodologically, it shows the benefit of aggregating strategy variables and taking focused strategy (strategy–performance) perspective for studying relations between strategy and performance. From a practical standpoint, the results imply that promoting strategic form-focused instruction and strategy use (i.e., task- and language-related as well as generic learning strategies) could be an alternative road for helping undergraduate ESL learners.

In summary, the present findings are not causal, but they furnish strong correlational and predictive indications that strategic language engagement is associated with academic English performance. The study highlights the role of strategy-aware pedagogy in tertiary education and suggests that future investigations should extend these findings to more heterogeneous samples, over time series, as well as instructional interventions.

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