

Cognitive Styles and Influences on Academic Writing: An Empirical Investigation among English Language Learners

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Abstract

This study explores how different cognitive styles influence writing performance among English language learners, focusing on a group of 220 second- and third-year students at Dai Nam University. The research aims to understand whether the way students think and process information, whether they are Field Dependent or Independent, Analytic or Holistic, Visual or Verbal, Reflective or Impulsive, affects their ability to excel in writing tasks. To assess this, we used a well-established cognitive style inventory and evaluated writing skills through the IELTS Writing Task 2, a standardized test known for its rigor in measuring academic writing proficiency.

Our analysis reveals some interesting patterns. Students with a Field Independent or Analytic cognitive style tended to score lower on writing tasks compared to those who were Field Dependent or Holistic thinkers. This suggests that students who prefer to rely on their own internal judgment and focus on details might struggle more with writing tasks that require broader thinking and external guidance. On the other hand, whether a student was more visual or verbal, reflective or impulsive, didn't seem to make a big difference in their writing performance.

These findings highlight the importance of recognizing and adapting to the diverse cognitive styles in the classroom. By understanding how students think, educators can better support their learning and help them develop stronger writing skills. This study offers valuable insights for teachers and curriculum designers aiming to improve writing instruction and outcomes for English language learners.

Keywords: cognitive styles, writing performance, English language learners, Field Dependent/Independent, Analytic/Holistic, IELTS Writing Task

1. Introduction

1.1 Background of the Study

Cognitive styles refer to the preferred ways in which individuals process information and approach learning tasks. These styles play a crucial role in language learning, as they influence how learners perceive, remember, and use language (Riding & Rayner, 2013). Understanding cognitive styles is particularly important in the context of English language learning, where individual differences can significantly affect the acquisition of language skills, including writing.

Cognitive styles encompass various dimensions, such as field independence vs. field dependence, analytic vs. holistic thinking, and visual vs. verbal processing (Witkin et al., 1977; Kozhevnikov, 2007). Field-independent learners tend to focus on details and analyze components of language, which can be beneficial in mastering grammatical rules and vocabulary. On the other hand, field-dependent learners are more attuned to the overall context and social aspects of communication, which may aid in understanding the pragmatics and discourse structures of a language (Riding & Rayner, 2013).

Analytic thinkers prefer a systematic approach to learning, breaking down tasks into smaller, manageable parts. This style can be advantageous in language learning scenarios that require precise attention to syntactic structures and error correction (Kozhevnikov, 2007). Conversely, holistic thinkers tend to process information in larger chunks, focusing on the overall meaning rather than individual components. This can enhance their ability to comprehend and produce coherent, connected discourse, which is essential in writing (Jonassen & Grabowski, 2012).

Visual learners, who prefer information presented in pictures, diagrams, and other visual formats, may excel in tasks that involve reading and writing, as they can visualize text structures and content organization. Verbal learners, who thrive on spoken or written words, might be more adept at tasks requiring extensive reading and writing, as they can effectively process and generate text-based information (Riding & Rayner, 2013).

Impact of Cognitive Styles on Writing Skills

Writing is a complex skill that integrates various cognitive processes, including planning, organizing, drafting, revising, and editing. The impact of cognitive styles on writing can be profound, as these styles influence how learners approach each stage of the writing process (Kellogg, 2008). For instance, analytic learners might excel in the planning and organizing stages, where attention to detail and logical structuring are paramount. Their preference for breaking down tasks into smaller parts allows them to create well-organized outlines and drafts, which can lead to clearer and more coherent writing (Witkin et al., 1977).

Field-dependent learners, who are more socially oriented and context-sensitive, might produce writing that is richer in contextual relevance and pragmatic appropriateness. Their sensitivity to social cues and overall context can help them craft narratives and essays that resonate with readers and adhere to cultural norms and expectations (Riding & Rayner, 2013). However, they might struggle with tasks that require strict adherence to grammatical rules and syntactic accuracy, areas where field-independent learners typically excel (Jonassen & Grabowski, 2012).

Holistic thinkers, with their focus on the big picture, may be particularly skilled in generating content that flows naturally and maintains coherence throughout a piece of writing. They might prioritize the overall message and thematic consistency, which is crucial in persuasive or argumentative writing (Kellogg, 2008). On the other hand, their tendency to overlook finer details could result in writing that lacks precision or contains errors that could have been avoided with a more analytic approach (Kozhevnikov, 2007).

Visual learners might find it easier to organize their ideas and structure their writing if they use visual aids like mind maps or graphic organizers. These tools can help them visualize the relationships between different parts of their text, leading to better-organized essays and reports (Riding & Rayner, 2013). In contrast, verbal learners, with their affinity for words, might excel in creating well-articulated and linguistically rich texts, drawing on their strengths in processing and producing language in its written form (Jonassen & Grabowski, 2012).

Cognitive styles are a significant factor in language learning, influencing how learners process information and approach different language tasks, including writing. Understanding these cognitive styles can help educators tailor their instruction to meet the diverse needs of learners, ultimately improving their writing skills. By recognizing the strengths and potential challenges associated with different cognitive styles, educators can provide more targeted support, enabling all learners to develop their writing abilities more effectively.

1.2 Statement of the Problem

Quantifying the relationship between cognitive styles and writing performance among English Language Learners (ELLs) is crucial for several reasons. First, while the influence of cognitive styles on various aspects of language learning, including reading comprehension and speaking, has been explored, the specific impact on writing performance remains under-researched and requires empirical validation (Kozhevnikov, 2007; Riding & Rayner, 2013). Writing is a multifaceted skill that involves not only linguistic knowledge but also cognitive processes such as planning, organizing, and revising, all of which can be influenced by an individual's cognitive style (Kellogg, 2008).

Second, existing literature indicates that different cognitive styles may either facilitate or hinder specific components of writing. For instance, field-independent learners, who tend to focus on details and structure, might excel in creating grammatically accurate and well-organized texts. Conversely, field-dependent learners might be better at maintaining coherence and producing contextually rich content but may struggle with accuracy (Witkin et al., 1977). These differences suggest that cognitive style is a significant variable that can potentially predict writing performance, making it essential to quantify this relationship to better understand its impact.

Moreover, quantification allows for the identification of specific cognitive styles that correlate with higher or lower writing performance, providing actionable insights for educators. By understanding these correlations, educators can develop targeted interventions that cater to the diverse cognitive preferences of their students, thereby enhancing writing instruction and outcomes (Jonassen & Grabowski, 2012). Quantitative analysis can also help in developing predictive models that inform instructional design and personalized learning strategies, ultimately contributing to more effective language education.

Finally, the quantification of this relationship addresses a gap in the existing research, where much of the focus has been on qualitative assessments or generalized observations rather than rigorous, data-driven analysis (Kozhevnikov, 2007). Quantitative research offers the precision and objectivity needed to establish clear, evidence-based connections between cognitive styles and writing performance, which can then be used to inform educational practices and policies for ELLs.

1.3 Purpose of the Study

The purpose of this study is to explore the relationship between cognitive styles and writing skills among English language learners, with a specific focus on quantifying how different cognitive processing preferences influence writing performance. By employing quantitative methods, this study aims to provide empirical evidence that can contribute to a deeper understanding of how cognitive styles influences the development and execution of writing tasks in a second language.

1.4 Significance of the Study

This study is significant because it addresses a critical need in language education for more tailored and effective teaching strategies. By quantifying the relationship between cognitive styles and writing skills, the study aims to provide actionable insights that can lead to better learning outcomes for English language learners. The results of this study could have far-reaching implications for curriculum design, instructional methods, and educational policy, particularly in the context of second language acquisition.

1.5 Research Questions

This study aims to investigate the relationship between cognitive styles and writing performance among English language learners. By examining how different cognitive styles influence writing abilities, the research seeks to identify which cognitive styles are most conducive to achieving higher writing scores. The findings from this study will contribute to a better understanding of how cognitive processing preferences can influence language learning outcomes, particularly in writing skills. The research questions guiding this study are as follows:

- (1) What is the relationship between cognitive styles and writing performance among English language learners?
- (2) Which cognitive styles are most strongly associated with higher writing scores?

2. Literature Review

2.1 Theories of Cognitive Style

Cognitive styles, particularly the concepts of field dependence and field independence, have been extensively studied in educational psychology. These terms describe how individuals perceive and process information within a given context, and they have significant implications for learning and teaching strategies.

2.1.1 Field-Dependent Cognitive Style

Individuals with a field-dependent cognitive style tend to perceive and process information as a whole rather than focusing on specific parts. They rely heavily on external cues and the surrounding context to make sense of information. This style often correlates with strong social skills and a preference for collaborative learning environments. Field-dependent learners are typically more responsive to social reinforcement and often excel in tasks that require interpersonal interactions, such as group discussions and cooperative problem-solving (Witkin, Moore, Goodenough, & Cox, 1977).

Field-dependent individuals may struggle in situations that require them to isolate a particular piece of information from its surrounding context. For instance, they might find it challenging to extract a single piece of data from a complex graph or to focus on details in a highly structured task without being influenced by the overall structure. As a result, they often perform better in environments that offer clear guidance and support, such as structured classrooms where teachers provide explicit instructions and feedback (Tinajero & Páramo, 1997).

2.1.2 Field-Independent Cognitive Style

Conversely, individuals with a field-independent cognitive style are more likely to perceive and process information analytically. They can easily distinguish details from the broader context, allowing them to focus on specific aspects of a task without being influenced by the surrounding environment. Field-independent learners tend to excel in tasks that require critical thinking, problem-solving, and independent work (Witkin et al., 1977).

Field-independent individuals often prefer working alone and are more self-reliant. They are typically less affected by social or external cues and may prefer learning environments that allow for autonomy and self-directed learning. This cognitive style is advantageous in tasks that require breaking down complex information into smaller components, such as mathematical problem-solving or analytical writing. However, field-independent learners

may face challenges in situations that require strong social interactions or collaboration, as they may not be as attuned to social dynamics as their field-dependent counterparts (Tinajero & Páramo, 1997).

2.1.3 Implications for Education and Learning

The distinction between field-dependent and field-independent cognitive styles has important implications for education. Teachers and educators can use this understanding to tailor instructional strategies to better suit the needs of their students. For instance, field-dependent learners may benefit from group work, interactive discussions, and structured learning activities that provide clear context and external support. On the other hand, field-independent learners might thrive in environments that offer opportunities for independent research, problem-solving tasks, and activities that require analytical thinking (Evans, 2004).

Moreover, recognizing these cognitive styles can help educators create more inclusive learning environments. By providing a balance of collaborative and independent activities, teachers can cater to the diverse cognitive preferences of their students, thereby enhancing overall learning outcomes.

In conclusion, the concepts of field dependence and field independence highlight the diversity in cognitive processing among individuals. While field-dependent learners excel in socially interactive and context-rich environments, field-independent learners perform better in analytical and self-directed tasks. Understanding these cognitive styles allows educators to design more effective and personalized learning experiences, ultimately supporting the academic success of all students.

2.2 Cognitive Style and Language Learning

Cognitive styles play a crucial role in how individuals acquire and develop language skills, including writing. Writing, as a complex cognitive and linguistic task, requires the integration of various skills such as organizing ideas, using appropriate vocabulary, and adhering to grammatical rules. The influence of cognitive styles on writing has been a subject of interest in language education research, particularly concerning how different cognitive processing preferences affect writing performance.

2.2.1 Field-Dependent vs. Field-Independent Cognitive Styles in Writing

One of the most extensively studied cognitive styles in relation to writing is the field-dependent and field-independent dichotomy. Research suggests that field-independent learners often excel in writing tasks that require analytical thinking and the ability to structure arguments logically. These individuals tend to focus on the syntactic and grammatical aspects of writing, often producing texts that are well-organized and coherent (Witkin et al., 1977; Riding & Cheema, 1991).

Field-dependent learners, on the other hand, may approach writing with a more holistic perspective, focusing on the content and overall message rather than the structural details. This can result in writing that is rich in ideas and contextually relevant but may lack the precision and organization seen in the work of field-independent learners (Tinajero & Páramo, 1998). Field-dependent writers are also more likely to seek feedback and guidance from others, relying on external validation to improve their writing (Ford & Chen, 2001).

Reflective vs. Impulsive Cognitive Styles in Writing

Reflective and impulsive cognitive styles also have significant implications for writing. Reflective writers tend to take more time in planning and revising their work. They carefully consider the organization of their ideas, the clarity of their arguments, and the accuracy of their language. This often leads to higher-quality writing, as reflective individuals are less likely to make errors and more likely to produce well-thought-out pieces (Kagan, 1965).

Impulsive writers, conversely, may approach writing with a sense of urgency, prioritizing speed over accuracy. Their writing may be characterized by fluency and spontaneity, but it is also more prone to errors and inconsistencies. While impulsive writers may generate ideas quickly, they often require more extensive revision to achieve the same level of quality as their reflective counterparts (Eysenck, 1997).

2.2.2 Verbal vs. Visual Cognitive Styles Cognitive Styles in Writing

The distinction between verbal and visual cognitive styles also impacts writing. Verbal learners, who process information primarily through language, tend to excel in tasks that involve written communication. They are more comfortable with linguistic structures and can effectively translate their thoughts into written text. Verbal learners are often more adept at handling tasks that involve complex language use, such as writing essays or reports (Jonassen & Grabowski, 1993).

Visual learners, while they may excel in tasks that involve spatial or visual reasoning, can sometimes struggle with writing. They may find it challenging to express their ideas in words, particularly when the task requires the use of abstract or complex language. However, visual learners can benefit from strategies that involve visual aids in the writing process, such as mind maps or diagrams, which can help them organize their thoughts before translating them into text (Miller, 2007).

2.2.3 Reflective vs Impulsive Cognitive Style in Writing

Reflective and impulsive cognitive styles refer to how individuals approach problem-solving and decision-making, particularly in situations that require careful thought or quick responses. These styles are often examined in the context of education and psychology to understand how they influence learning and performance.

Individuals with a reflective cognitive style tend to take their time when making decisions. They carefully analyze information, consider alternatives, and weigh the pros and cons before arriving at a conclusion. Reflective learners are methodical and deliberate, often focusing on accuracy rather than speed. They prefer to gather as much information as possible to make well-informed decisions and avoid mistakes.

Reflective learners may excel in tasks that require deep understanding and analysis, such as writing essays, solving complex problems, or conducting research. However, their tendency to take more time might lead to slower progress in time-sensitive tasks, which could be a disadvantage in competitive or high-pressure environments.

In contrast, individuals with an impulsive cognitive style tend to make decisions quickly, often based on their initial impressions or gut feelings. They prioritize speed over accuracy and are more likely to take risks. While this can lead to quicker decision-making, it may also result in more errors or less thoroughly considered outcomes.

2.2.4 Implications for Language Teaching

Understanding the impact of cognitive styles on writing can help educators tailor their teaching strategies to meet the needs of different learners. For instance, field-independent learners might benefit from activities that challenge their analytical skills, such as essay writing or research-based projects. Field-dependent learners, on the other hand, could be supported through collaborative writing tasks or assignments that allow for peer feedback.

Reflective learners might thrive in environments that provide ample time for planning and revision, while impulsive learners may need guidance in developing self-editing skills. Visual learners could be encouraged to use visual aids during the pre-writing stage to help them organize their ideas.

2.3 Gaps in the Literature in the Quantification of Cognitive Style Effects on Writing Skills

The influence of cognitive styles on writing skills has been a focal point of research in educational psychology, yet several gaps remain, particularly concerning the quantification of these effects. While qualitative studies and theoretical discussions have offered valuable insights, the precise measurement and statistical analysis of how different cognitive styles influences writing performance are areas where more research is needed.

2.3.1 Limited Quantitative Studies

One of the primary gaps in the existing literature is the scarcity of quantitative studies that explicitly measure the impact of cognitive styles on writing skills. While there is a substantial body of research exploring the general influence of cognitive styles on learning, studies that use rigorous statistical methods to quantify these effects specifically in the context of writing are relatively few. Most existing studies tend to rely on correlational data rather than experimental designs, which limits the ability to draw causal inferences about the relationship between cognitive styles and writing performance (Zhang, 2004).

2.3.2 Need for Longitudinal Research

Another gap is the lack of longitudinal studies that track the development of writing skills over time in relation to cognitive styles. Most research in this area has been cross-sectional, capturing data at a single point in time. Longitudinal studies would provide a more comprehensive understanding of how cognitive styles influence the development of writing skills throughout different stages of education, from early childhood to adulthood (Evans & Waring, 2006).

2.3.3 Insufficient Focus on Diverse Populations

Current research on cognitive styles and writing often lacks diversity in its sample populations. Much of the existing research has been conducted in Western educational contexts, with limited exploration of how cognitive styles might influence writing in non-Western cultures or among learners of different ages, socioeconomic backgrounds, or educational levels. This gap suggests a need for more inclusive research that considers how

cultural, linguistic, and contextual factors might interact with cognitive styles to affect writing skills (Chen & Ford, 1998).

2.3.4 Variability in Measurement Tools

There is also a gap related to the variability in the tools and methods used to measure cognitive styles and writing skills. Different studies employ different instruments to assess cognitive styles, such as the Group Embedded Figures Test (GEFT) for field dependence/independence or the Cognitive Style Analysis (CSA). Similarly, the criteria used to evaluate writing performance vary widely across studies, ranging from holistic assessments to more granular analysis of specific writing components like grammar, coherence, and argumentation (Riding & Rayner, 1998). This inconsistency makes it difficult to compare results across studies and to generalize findings.

2.3.5 Lack of Integration with Cognitive Neuroscience

Another emerging gap is the limited integration of cognitive neuroscience with research on cognitive styles and writing. Advances in neuroimaging and cognitive neuroscience offer the potential to explore the neural correlates of cognitive styles and their influence on writing processes. However, this area remains largely unexplored, and there is significant potential for future research to bridge this gap by combining traditional cognitive style assessments with neuroscientific methods (Hirsh, 2004).

2.3.6 Inadequate Exploration of Intervention Strategies

Finally, there is a need for more research on intervention strategies that can mitigate the challenges associated with certain cognitive styles in writing. While some studies have explored teaching methods tailored to different cognitive styles, there is a lack of robust experimental research testing the effectiveness of these interventions. Future research should focus on developing and empirically validating instructional strategies that cater to diverse cognitive styles to improve writing outcomes (Riding & Sadler-Smith, 1997).

While significant progress has been made in understanding the relationship between cognitive styles and writing skills, several gaps remain, particularly in the quantification of these effects. Addressing these gaps through more rigorous quantitative studies, longitudinal research, diverse populations, consistent measurement tools, integration with cognitive neuroscience and exploration of intervention strategies will provide a more comprehensive understanding of how cognitive styles affects writing. This, in turn, can inform more effective teaching practices that cater to the diverse cognitive needs of learners.

3. Research Methodology

3.1 Research Design

A correlational research design will be used to examine the relationship between cognitive styles and writing skills among ELLs.

3.2 Participants

The participants in this study consist of 220 students who are currently enrolled in the 2nd and 3rd years of the English program at Dai Nam University. These students were selected to provide a representative sample of English language learners at an intermediate level of their academic journey. The diversity in cognitive styles among these participants allows for a comprehensive examination of how different cognitive processing preferences might influence writing performance within this specific educational context.

3.3 Instruments

To assess the cognitive styles and writing performance of the participants, this study employed two primary instruments:

3.3.1 Cognitive Style Inventory

The cognitive styles of the participants were measured using a validated cognitive style questionnaire. Instruments such as the Group Embedded Figures Test (GEFT) and Kolb's Learning Style Inventory were utilized to categorize participants into specific cognitive styles, such as Field Dependent/Independent, Analytic/Holistic, Visual/Verbal, and Reflective/Impulsive. These tools are well-established in cognitive psychology and provide reliable assessments of how individuals process information and learn.

3.3.2 Writing Assessment

Participants' writing skills were evaluated using the IELTS Writing Task 2, a standardized test commonly used to assess writing ability in academic English contexts. This task requires participants to produce an extended response to a given prompt, allowing for the evaluation of various aspects of writing, including coherence,

cohesion, lexical resource, and grammatical accuracy. The use of the IELTS Writing Task 2 ensures that the writing assessment is both rigorous and aligned with internationally recognized standards.

3.4 Variables

In this study, two primary variables were examined; Independent Variable: The independent variable is Cognitive Style, which was measured using a validated cognitive style inventory. This inventory categorized participants into distinct cognitive styles, such as Field Dependent/Independent, Analytic/Holistic, Visual/Verbal, and Reflective/Impulsive. These categories represent the different ways in which individuals process information and approach learning tasks, serving as the key factor being analyzed for its impact on writing performance. Dependent Variable: The dependent variable is Writing Performance, which was measured through standardized writing test scores, specifically using the IELTS Writing Task 2. Writing performance was assessed based on participants' ability to produce a coherent, cohesive, and linguistically accurate essay in response to a given prompt. The scores reflect the participants' proficiency in academic writing, providing a quantifiable measure of their writing skills.

3.5 Data Collection Procedure

The data collection process for this study was carried out in two main stages

3.5.1 Cognitive Style Assessment

Participants were first asked to complete a validated cognitive style inventory, such as the Group Embedded Figures Test (GEFT) or Kolb's Learning Style Inventory. This assessment was administered in a controlled classroom setting to ensure that all participants had a consistent environment in which to complete the inventory. The results of the cognitive style inventory were then used to categorize participants into distinct cognitive style groups, such as Field Dependent/Independent, Analytic/Holistic, Visual/Verbal, and Reflective/Impulsive.

3.5.2 Writing Performance Assessment

Following the cognitive style assessment, participants were asked to complete the IELTS Writing Task 2 under standardized test conditions. This writing task required participants to produce an essay in response to a given prompt, which was then scored by trained evaluators according to the IELTS scoring criteria. The writing scores were recorded and used as the primary measure of participants' writing performance.

Both assessments were conducted within the same academic term to ensure that the data reflected the participants' cognitive styles and writing abilities during a similar period in their educational journey.

3.6 Data Analysis

The collected data were analyzed using a combination of descriptive and inferential statistical methods:

Descriptive Statistics: Initially, descriptive statistics were computed to summarize the basic features of the data, including the mean, standard deviation, and frequency distributions of both cognitive style categories and writing scores. This provided an overview of the data and helped to identify any initial patterns or trends.

Multiple Regression Analysis: To explore the relationship between cognitive styles and writing performance, a multiple regression analysis was conducted. In this analysis, writing performance (measured by the IELTS Writing Task 2 scores) was treated as the dependent variable, while the different cognitive styles served as independent variables. The regression analysis allowed for the identification of which cognitive styles were most strongly associated with writing performance, and the extent to which these styles predicted the variance in writing scores.

Independent Samples t-Test: Additionally, independent samples t-tests were performed to compare writing scores between specific cognitive style groups (e.g., Field Dependent vs. Field Independent). This helped to determine whether there were significant differences in writing performance based on cognitive style.

Interpretation of Results: The results of the statistical analyses were interpreted to answer the research questions, focusing on the strength and significance of the relationships between cognitive styles and writing performance. The findings were then used to draw conclusions about the impact of cognitive styles on writing skills among English language learners.

4. Results

4.1 What is the Relationship between Cognitive Styles and Writing Performance among English Language Learners?

4.1.1 Field Dependent/Independent vs Writing Score

The frequency distribution of the Field Category variable (Table 1) indicates that a majority of the participants in the study are categorized as Field Independent learners. Specifically, 146 out of 220 individuals, or 66.4% of the

sample, are classified as Field Independent. In contrast, 74 participants, representing 33.6% of the sample, are classified as Field Dependent. The cumulative percentage shows that by the time both categories are considered, the entire sample is accounted for, with Field Independent learners forming a significant majority.

This distribution suggests that within the sample, Field Independent cognitive styles are more prevalent than Field Dependent styles. This prevalence may have implications for how learning strategies are tailored, as a majority of the learners may benefit more from approaches that emphasize independence and self-directed learning.

Table 1. Field category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Field Independent	146	66.4	66.4	66.4
	Field Dependent	74	33.6	33.6	100.0
	Total	220	100.0	100.0	

The Independent Samples t-Test was conducted to examine the difference in writing scores between Field Dependent and Field Independent learners (table 2). Levene’s test for equality of variances produced an F-value of 9.633 with a significance level of 0.002, indicating that the assumption of equal variances is violated. Since the p-value is less than 0.05, the variances between the two groups are significantly different, and we should rely on the t-test results under the "Equal variances not assumed" condition.

Under this condition, the t-test yielded a t-value of 3.290 with 128.816 degrees of freedom and a significance (2-tailed) p-value of 0.001. This p-value is below the 0.05 threshold, indicating a statistically significant difference in writing scores between the Field Dependent and Field Independent groups.

The mean difference in writing scores between the two groups is 0.308 points, with a standard error of 0.094. The 95% confidence interval for the mean difference ranges from 0.123 to 0.494. Since this confidence interval does not include zero, it further confirms that the difference in writing scores between the groups is significant.

These results suggest that Field Independent learners tend to have higher writing scores compared to Field Dependent learners. The positive mean difference of 0.308 points indicates that the cognitive style associated with independence and self-reliance is advantageous in writing tasks, potentially due to the structured and analytical approach favoured by Field Independent learners.

Table 2. Independent Samples Test

		Levene's Test for Equality of Variances								
		F	Sig.	t-test for Equality of Means			Std. Dif.	95% Confidence Interval of the Difference		
				t	df	Sig. (2-tailed)		Mean Dif.	Lower	Upper
TEST RESULTS	Equal variances assumed	9.633	.002	3.456	218	.001	.308	.089	.132	.484
	Equal variances not assumed			3.290	128.82	.001	.308	.094	.123	.494

4.1.2 Analytic/Holistic Thinking vs Writing Score

The frequency distribution for the Analytic Category variable reveals that a majority of the participants in the study are categorized as Analytic thinkers. Specifically, 134 out of 220 individuals, or 60.9% of the sample, fall into the Analytic category. This suggests that these learners tend to prefer structured, detail-oriented approaches to processing information. In contrast, 86 participants, representing 39.1% of the sample, are categorized as Holistic thinkers, indicating a preference for seeing the bigger picture and integrating information contextually.

The cumulative percentage shows that after accounting for both groups, the entire sample is covered, with Analytic thinkers comprising the majority. This distribution suggests that within this sample, Analytic cognitive styles are more prevalent than Holistic styles, which could have implications for how learning strategies and educational materials are designed to cater to the dominant cognitive style (table 3).

Table 3. Analytic Category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Analytic	134	60.9	60.9	60.9
	Holistic	86	39.1	39.1	100.0
	Total	220	100.0	100.0	

The Independent Samples t-Test was conducted to determine whether there is a significant difference in writing scores between learners with Analytic cognitive styles and those with Holistic cognitive styles (table 4). Levene’s test for equality of variances resulted in an F-value of 2.723 with a significance level of 0.100. Since the p-value is greater than 0.05, we fail to reject the null hypothesis of equal variances, indicating that the assumption of equal variances is met. Therefore, we can focus on the t-test results under the "Equal variances assumed" condition.

The t-test results show a t-value of 2.413 with 218 degrees of freedom, and the associated p-value is 0.017, which is less than the 0.05 threshold. This indicates that there is a statistically significant difference in writing scores between learners with Analytic cognitive styles and those with Holistic cognitive styles.

The mean difference in writing scores between the two groups is 0.234 points, with a standard error of 0.097. The 95% confidence interval for the mean difference ranges from 0.043 to 0.425. Since this confidence interval does not include zero, it further confirms that the difference in writing scores between the groups is significant.

These findings suggest that learners with Analytic cognitive styles tend to have higher writing scores compared to those with Holistic cognitive styles. The positive mean difference of 0.234 points indicates that the structured and detail-oriented approach characteristic of Analytic thinkers may provide an advantage in writing tasks.

Table 4. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif.	Std. Error Dif.	95% Interval Lower	Confidence Upper
Test Results	Equal variances assumed	2.723	.100	2.413	218	.017	.234	.097	.043	.425
	Equal variances not assumed			2.396	177.26	.018	.234	.098	.041	.426

4.1.3 Visual/Verbal Processing vs Writing Score

The frequency distribution for the Visual Category variable indicates that a significant majority of the participants in the study are categorized as Visual processors. Specifically, 187 out of 220 individuals, or 85.0% of the sample, fall into the Visual Processing category. This suggests that these learners primarily prefer to process information through visual means, such as images, diagrams, and spatial relationships.

In contrast, only 33 participants, representing 15.0% of the sample, are categorized as Verbal processors, indicating a preference for processing information through language, such as reading and writing. The cumulative percentage shows that after accounting for both groups, the entire sample is included, with Visual processors making up the overwhelming majority (Table 5).

This distribution highlights the dominance of Visual cognitive styles within the sample, which could have important implications for instructional design. Educational materials and teaching strategies that leverage visual aids and spatial learning might be particularly effective for the majority of learners in this group.

Table 5. Visual Category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Visual Processing	187	85.0	85.0	85.0
	Verbal Processing	33	15.0	15.0	100.0
	Total	220	100.0	100.0	

The Independent Samples t-Test was conducted to determine whether there is a significant difference in writing scores between learners with Visual cognitive styles and those with Verbal cognitive styles (Table 6). Levene’s test for equality of variances yielded an F-value of 0.013 with a significance level of 0.909. Since the p-value is much greater than 0.05, we fail to reject the null hypothesis of equal variances, indicating that the assumption of equal variances is met. Therefore, we can rely on the t-test results under the "Equal variances assumed" condition.

The t-test results show a t-value of 2.520 with 218 degrees of freedom, and the associated p-value is 0.012, which is below the 0.05 threshold. This indicates that there is a statistically significant difference in writing scores between learners with Visual cognitive styles and those with Verbal cognitive styles.

The mean difference in writing scores between the two groups is 0.333 points, with a standard error of 0.132. The 95% confidence interval for the mean difference ranges from 0.073 to 0.594. Since this confidence interval does not include zero, it further confirms that the difference in writing scores between the groups is statistically significant.

These findings suggest that learners with Verbal cognitive styles tend to have higher writing scores compared to those with Visual cognitive styles. The positive mean difference of 0.333 points indicates that the preference for processing information through language, characteristic of Verbal learners, may provide an advantage in writing tasks.

Table 6. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif.	Std. Error Dif.	95% Confidence Interval of the Dif.
								Lower	Upper
Test Result	Equal variances assumed	.013	.909	2.520	218	.012	.333	.132	.073 .594
	Equal variances not assumed			2.650	46.03	.011	.333	.126	.080 .586

4.1.4 Reflective/Impulsive Decision-Making vs Writing Score

The frequency distribution for the Reflective Category variable shows that a majority of the participants in the study are categorized as Reflective decision-makers (Table 7). Specifically, 151 out of 220 individuals, or 68.6% of the sample, fall into the Reflective Decision-Making category. This suggests that these learners tend to carefully consider their options before making decisions, reflecting on possible outcomes.

In contrast, 69 participants, representing 31.4% of the sample, are categorized as Impulsive decision-makers, indicating a preference for making quick decisions with less deliberation. The cumulative percentage indicates that after accounting for both groups, the entire sample is represented, with Reflective decision-makers comprising the majority.

This distribution suggests that Reflective decision-making is more prevalent within the sample compared to Impulsive decision-making. This could have implications for educational strategies, as a focus on allowing time for reflection and analysis may be beneficial for the majority of learners in this group.

Table 7. Reflective Category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Reflective Decision-Making	151	68.6	68.6	68.6
	Impulsive Decision-Making	69	31.4	31.4	100.0
	Total	220	100.0	100.0	

The Independent Samples t-Test was conducted to assess whether there is a significant difference in writing scores between learners with Reflective decision-making styles and those with Impulsive decision-making styles (Table 8). Levene’s test for equality of variances produced an F-value of 0.173 with a significance level of 0.678.

Since the p-value is greater than 0.05, the assumption of equal variances is met, allowing us to focus on the t-test results under the "Equal variances assumed" condition.

The t-test results show a t-value of 0.150 with 218 degrees of freedom, and the associated p-value is 0.881, which is well above the 0.05 threshold. This indicates that there is no statistically significant difference in writing scores between learners with Reflective decision-making styles and those with Impulsive decision-making styles.

The mean difference in writing scores between the two groups is very small, at 0.015 points, with a standard error of 0.103. The 95% confidence interval for the mean difference ranges from -0.188 to 0.219. Since this confidence interval includes zero, it further confirms that there is no meaningful difference in writing scores between the groups.

These findings suggest that whether a learner is more Reflective or Impulsive in their decision-making style does not significantly impact their writing performance. Both groups appear to perform similarly in writing tasks, indicating that decision-making style may not be a strong predictor of writing ability in this sample.

Table 8. Independent Samples Test

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif.	Std. Error Dif.	95% Confidence Interval of the Dif.	
									Lower	Upper
Test Results	Equal variances assumed	.173	.678	.150	218	.881	.015	.103	-.188	.219
	Equal variances not assumed			.153	140.0	.878	.015	.101	-.184	.215

4.2 Which Cognitive Styles are most Strongly Associated with Higher Writing Scores?

The multiple regression analysis aimed to explore the relationship between various cognitive styles and writing performance among English language learners (Table 9). The analysis revealed that the Field Category is the most significant predictor of writing scores. Specifically, learners classified as Field Independent tend to score significantly lower in writing compared to Field Dependent learners, as indicated by a large negative standardized coefficient (Beta = -0.520) and a highly significant p-value (0.000). This suggests that a Field Independent cognitive style, which emphasizes internal frames of reference and self-reliance, may be less conducive to writing tasks that potentially benefit from external guidance and structure.

In addition to the Field Category, the Analytic cognitive style also showed a significant negative association with writing scores, although its impact was less pronounced. Learners with an Analytic cognitive style, who tend to focus on details and structured thinking, scored lower on writing tasks compared to their Holistic counterparts, with a Beta value of -0.151 and a p-value of 0.012. This finding suggests that a more holistic approach, which integrates information contextually and emphasizes the big picture, might be advantageous in writing.

On the other hand, the Visual and Reflective cognitive styles did not show significant associations with writing performance. Although the Visual Category had a slight negative impact on writing scores (Beta = -0.086), this relationship was not statistically significant (p-value = 0.167). Similarly, the Reflective Category, with a near-zero Beta value (0.009) and a p-value of 0.881, indicated no meaningful effect on writing outcomes. These results imply that whether a learner processes information visually or verbally, or whether they are reflective or impulsive in their decision-making, does not strongly influence their writing performance in this context.

In summary, the analysis highlights the Field and Analytic cognitive styles as significant factors in writing performance, with Field Independent and Analytic learners potentially facing greater challenges in writing tasks. These findings suggest that tailored instructional strategies might be needed to support these learners in improving their writing skills.

Table 9. Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	4.062	.065		62.787	.000
1					
Field category	-.764	.084	-.520	-9.100	.000
Analytic category	-.218	.086	-.151	-2.535	.012
Visual category	-.171	.123	-.086	-1.388	.167
Reflective category	.014	.092	.009	.149	.881

a. Dependent Variable: Test Results

5. Discussion

The findings of this study provide significant insights into the relationship between cognitive styles and writing performance among English language learners at Dai Nam University. The results from the multiple regression analysis and independent samples t-tests highlight the varying impact of different cognitive styles on writing outcomes.

One of the key findings is the strong negative association between the Field Independent cognitive style and writing performance. Learners who exhibited a Field Independent style, characterized by a preference for internal frames of reference and self-reliance, tended to score lower in writing tasks compared to their Field Dependent counterparts. This result suggests that the structured and externally guided approach typical of Field Dependent learners may be more conducive to successful writing in academic contexts. The significant Beta value and p-value associated with the Field Independent category emphasize the importance of considering cognitive style when developing writing curricula and instructional strategies.

Similarly, the Analytic cognitive style was found to negatively predict writing performance, though to a lesser extent than the Field Independent style. Analytic learners, who typically focus on detail-oriented and structured thinking, performed worse in writing tasks compared to Holistic learners, who approach tasks by integrating information and seeing the big picture. This finding aligns with previous research suggesting that holistic approaches may be more effective in tasks that require creativity and coherence, such as writing. The moderate negative Beta value associated with the Analytic style underscores the need for instructional approaches that balance both analytic and holistic strategies to support diverse learners.

In contrast, the study found no significant impact of Visual or Reflective cognitive styles on writing performance. The lack of significant findings for these styles suggests that the mode of information processing (visual vs. verbal) and decision-making style (reflective vs. impulsive) may not be as critical in determining writing success as the Field and Analytic styles. This outcome indicates that while certain cognitive styles are clearly linked to writing performance, others may have a more nuanced or context-dependent impact.

Overall, these findings contribute to a deeper understanding of how cognitive styles influence writing performance, with practical implications for educators and curriculum designers. By recognizing the specific challenges faced by Field Independent and Analytic learners, educators can tailor their instruction to provide more structured guidance and encourage holistic thinking in writing tasks.

6. Conclusion

This study set out to explore the relationship between cognitive styles and writing performance among 2nd and 3rd-year English language learners at Dai Nam University. The results indicate that cognitive style is a significant predictor of writing performance, with Field Independent and Analytic styles being associated with lower writing scores. In particular, Field Dependent and Holistic learners demonstrated stronger writing abilities, suggesting that instructional strategies that emphasize external guidance and holistic thinking may be more effective in improving writing outcomes.

The implications of these findings are particularly relevant for educators seeking to enhance writing instruction. By understanding the cognitive styles of their students, teachers can adapt their methods to better support those who may struggle with traditional writing tasks. For example, providing more structured frameworks and promoting big-picture thinking can help Field Independent and Analytic learners develop their writing skills.

However, it is also important to recognize the limitations of this study. The sample was limited to a specific group of students at Dai Nam University, which may affect the generalizability of the findings. Future research could

expand on these results by exploring cognitive styles and writing performance in different educational contexts and among more diverse populations.

In conclusion, this study underscores the importance of considering cognitive styles in writing instruction. By aligning teaching methods with the cognitive preferences of learners, educators can foster more effective learning environments and improve writing outcomes for all students.

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Appendix A

Cognitive Style Inventory and Questionnaire

Part 1: Field Independence vs. Field Dependence

For each statement, indicate how much you agree or disagree using the following scale:

1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree

#	Statements	Ratings
1	I prefer to work alone rather than in groups. (Field Independent)	① ② ③ ④ ⑤
2	I find it easier to learn new information when I can see how it relates to things I already knows. (Field Dependent)	① ② ③ ④ ⑤
3	I often notice details that others miss. (Field Independent)	① ② ③ ④ ⑤
4	When solving problems, I focus on the overall situation rather than the specific details. (Field Dependent)	① ② ③ ④ ⑤
5	I am comfortable following instructions without needing additional explanations. (Field Independent)	① ② ③ ④ ⑤

Part 2: Analytic vs. Holistic Thinking

#	Statements	Ratings
1	I like to break down complex tasks into smaller, manageable steps. (Analytic)	① ② ③ ④ ⑤
2	I often try to understand the whole picture before focusing on the details. (Holistic)	① ② ③ ④ ⑤
3	When learning something new, I prefer to start with the basics and build up from there. (Analytic)	① ② ③ ④ ⑤
4	I find it easier to understand new concepts when I see how they fit into the bigger picture. (Holistic)	① ② ③ ④ ⑤
5	I pay attention to specific rules and guidelines when completing a task. (Analytic)	① ② ③ ④ ⑤

Part 3: Visual vs. Verbal Processing

#	Statements	Ratings
1	I remember information better when it's presented visually, such as in charts or diagrams. (Visual)	① ② ③ ④ ⑤
2	I prefer to learn by reading text or listening to explanations. (Verbal)	① ② ③ ④ ⑤
3	I find it helpful to draw diagrams or pictures when trying to understand new concepts. (Visual)	① ② ③ ④ ⑤
4	I can easily follow spoken instructions without needing to see them written down. (Verbal)	① ② ③ ④ ⑤
5	I often use mental images to remember things. (Visual)	① ② ③ ④ ⑤

Part 4: Reflective vs. Impulsive Decision-Making

#	Statements	Ratings
1	I take my time to think through all possible options before making a decision. (Reflective)	① ② ③ ④ ⑤
2	I prefer to make quick decisions and act immediately. (Impulsive)	① ② ③ ④ ⑤
3	I often reflect on my past experiences before deciding on a course of action. (Reflective)	① ② ③ ④ ⑤
4	I trust my instincts and often go with the first idea that comes to mind. (Impulsive)	① ② ③ ④ ⑤
5	I tend to analyse situations thoroughly before taking action. (Reflective)	① ② ③ ④ ⑤

Appendix B

Scoring and Interpretation

- (1) Field Independence vs. Field Dependence: Sum the scores for questions in Part 1. Higher scores indicate a preference for field independence, while lower scores suggest field dependence.
- (2) Analytic vs. Holistic Thinking: Sum the scores for questions in Part 2. Higher scores indicate a preference for analytic thinking, while lower scores suggest holistic thinking.
- (3) Visual vs. Verbal Processing: Sum the scores for questions in Part 3. Higher scores indicate a preference for visual processing, while lower scores suggest verbal processing.
- (4) Reflective vs. Impulsive Decision-Making: Sum the scores for questions in Part 4. Higher scores indicate a preference for reflective decision-making, while lower scores suggest impulsive decision-making.

Appendix C

Using the Results

- (1) Tailor Instruction: Use the results to adapt your teaching methods to better suit the cognitive styles of your learners. For example, learners with a preference for visual processing might benefit from more diagrams and visual aids, while those with a holistic approach might appreciate seeing the overall structure of a lesson before diving into details.
- (2) Group Dynamics: Consider cognitive styles when forming groups for collaborative work. Mixing different styles can lead to more balanced and effective group dynamics.
- (3) Personalized Feedback: Provide feedback that aligns with learners' cognitive preferences. For instance, if a learner is more analytic, detailed and structured feedback might be more effective.

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