

A Study on the Impact of Critical Thinking Skills and Foreign Language Enjoyment on Foreign Language Performance

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Abstract

The importance of critical thinking skills and foreign language enjoyment in foreign language learning has been widely recognized, but the specific pathways through which they influence foreign language performance are not yet clear. This study surveyed foreign language learners based on the rational-emotional theory and used path analysis to explore the mediating effect of foreign language enjoyment between critical thinking skills and foreign language performance. The results revealed that: 1) Critical thinking skills and foreign language enjoyment significantly positively predicted foreign language performance; 2) Critical thinking skills significantly positively predicted foreign language enjoyment; 3) Critical thinking skills indirectly influenced foreign language performance through promoting foreign language enjoyment, indicating that foreign language enjoyment partially mediated the positive prediction of critical thinking skills on foreign language performance. These findings confirm the importance of cultivating critical thinking skills and eliciting positive emotions for successful foreign language learning.

Keywords: Critical Thinking Skills, Foreign Language Enjoyment, Foreign Language Performance, Mediating Effect

Introduction

Although multiple studies have shown that critical thinking skills can enhance foreign language learning (Afshar & Movassagh, 2017; Liang & Fung, 2021), it remains unclear through which pathways critical thinking skills promote foreign language learning. Research indicates that learners with high levels of critical thinking skills tend to maintain an open mindset, demonstrating tolerance and understanding towards different perspectives. They are more likely to develop rational, stable, and positive academic emotions (Kang, 2015). Academic emotions are closely related to academic performance (Camacho-Morles et al., 2021). Considering the facilitative role of positive emotions in foreign language learning (Dewaele & Alfawzan, 2018; Botes et al., 2022), this study aims to explore the pathways through which critical thinking skills influence foreign language performance by focusing on

the mediating effect of positive emotions. The goal is to provide empirical evidence and references for improving foreign language performance.

Literature Review

Critical Thinking Skills and Foreign Language Performance

Critical thinking skills involve deep reflection and analysis of phenomena (Facione, 2011). The "information-processing theory" in cognitive psychology provides a theoretical framework for understanding the relationship between critical thinking skills and foreign language performance. According to this theory, thinking is the process by which the human brain processes input information, and critical thinking involves using existing knowledge to analyze, compare, reason, and synthesize external information (Simon, 1979). In this process, abstract patterns are formed in the brain that facilitate knowledge acquisition and performance improvement.

In recent years, multiple studies have confirmed the importance of critical thinking skills in foreign language learning. On one hand, critical thinking skills contribute to overall improvements in foreign language performance across different proficiency levels. For example, research on university-level foreign language learners has shown that compared to instrumental motivation and autonomous learning strategies, critical thinking skills have a stronger predictive effect on foreign language performance (Afshar et al., 2014), as well as a higher correlation with learning strategies (Afshar & Movassagh, 2017). Investigations with elementary school students also indicate that critical thinking skills contribute to better foreign language performance (Liang & Fung, 2021).

On the other hand, critical thinking skills support the development of various foreign language abilities. For instance, critical thinking skills have a significant impact on improving writing proficiency in foreign languages (Gao & Wen, Qiu Fang, 2017) and reading comprehension abilities (Heidari, 2020). Although there is empirical evidence and a theoretical basis for the relationship between critical thinking skills and overall foreign language performance and various foreign language abilities, the specific pathways through which critical thinking skills influence foreign language earnings remain unclear.

Critical Thinking Skills and Academic Emotions

The human brain possesses three fundamental functions: thinking, emotions, and willpower, with thinking influencing emotions and willpower (Elder, 1997). According to the rational-emotive theory, it is not external factors that trigger emotions but rather individuals' attitudes, perspectives, evaluations, and other cognitive processes (Ellis, 1991). Therefore, changing one's way of thinking is a prerequisite for regulating emotions. This requires learners to avoid rigid thought patterns and engage in critical thinking (Moon, 2007).

Previous research has shown that individuals with critical thinking skills process emotional information more effectively, proactively, and calmly (Li et al., 2021), and engaging in critical thinking can lead to more rational emotions (Ellis, 1991; Elder, 1997). Studies on Iranian English major university students (Afshar & Rahimi, 2016), Indian freshmen (Sk & Halder, 2020), and Malaysian graduate students (Kang, 2015) have all demonstrated a close relationship between critical thinking skills and emotional intelligence. Additionally, a survey conducted on adult male Iranian English language learners revealed a significant negative correlation between critical thinking skills and negative emotions such as anxiety (Aghajani & Gholamrezapour, 2019). It is evident that critical thinking skills are closely related to emotional development. However, past research has focused mainly on the relationship

between critical thinking skills and negative emotions without delving deep into the exploration of their relationship with positive emotions.

Academic Emotions and Foreign Language Performance

Driven by positive psychology, the important role of positive emotions in foreign language learning has received increasing attention. According to control-value theory (Pekrun, 2006), individuals who experience positive emotions (such as joy) are less likely to experience fatigue and boredom. They are also more capable of self-reflection and regulation, which contributes to a stronger sense of control over the learning process.

Previous research has shown that academic emotions have an impact on foreign language performance. Positive emotions (such as enjoyment in learning a foreign language) are positively correlated with foreign language performance (Jiang & Dewaele, 2019; Lianqi & Meihua, 2022), while negative emotions (such as foreign language anxiety) are negatively correlated with it (Jiang & Dewaele, 2019). Furthermore, surveys conducted among English and Saudi Arabian foreign language learners indicate that the influence of enjoyment on foreign language performance is greater than that of anxiety (Dewaele & Alfawzan, 2018). Surveys conducted among Japanese foreign language learners also suggest that enjoyment has a higher predictive power for predicting proficiency development compared to anxiety levels (Saito et al., 2018). Moreover, a meta-analysis involving 56 empirical studies confirmed the importance of enjoyment in improving foreign language performance (Botes et al., 2022). Individuals with high levels of enjoyment are more likely to experience pleasure in their language learning journey. This enhances their resilience in overcoming difficulties faced during the process and improves sustainability in their foreign language learning (Lianqi & Meihua, 2022).

Although negative emotions may be unavoidable at times, positive emotions play a more crucial role in enhancing foreign language performance. However, past research has primarily focused on the enjoyment of university-level foreign language learners (such as Li Chengchen and Han Ye, 2022), with less attention given to the relationship between positive emotions and foreign language performance among learners in other educational stages.

In summary, critical thinking skills contribute to more rational academic emotions (Li et al., 2021), and these academic emotions further influence foreign language performance (Dewaele & Alfawzan, 2018). This suggests that academic emotions may play a mediating role between critical thinking skills and foreign language performance. According to the Rational-Emotive Theory's ABC model (Ellis, 1991), individual emotions are not directly caused by activating events but are influenced by the individual's beliefs and thoughts, resulting in emotional consequences. In the ABC model, A refers to activating events, B refers to beliefs or cognitive processes, and C refers to emotional and behavioral consequences (Ellis, 1991). Therefore, the Rational-Emotive Theory provides a comprehensive theoretical framework for analyzing the mediating role of academic emotions between critical thinking skills and foreign language performance.

Villavicencio (2011) surveyed 220 engineering students and found that negative emotions fully mediated the relationship between critical thinking skills and academic performance but did not explore potential mediation effects of positive emotions. Positive emotions enhance learning interest, stimulate engagement and involvement in learning activities, and promote better academic performance (Sadoughi & Hejazi, 2021). The significant role of positive emotions in foreign language learning has also been increasingly recognized (Dewaele & Alfawzan, 2018; Botes et al., 2022). Therefore, it is important to explore the potential

mediation effects of positive emotions like foreign language enjoyment between critical thinking skills and foreign language performance.

According to the aforementioned literature review, the study's research gap is due to the lack of knowledge about how critical thinking abilities and enjoyment affect proficiency in a foreign language. While earlier study has looked at specific aspects like enjoyment or critical thinking independently, there is a paucity of thorough research that looks at their combined impact on fluency in foreign languages. By examining the link between these variables and their combined influence, this study seeks to close this gap. Its contribution is in giving a comprehensive understanding with useful consequences for educators, fostering learner autonomy, offering suggestions for curriculum design, and laying the foundation for further research in this field.

Research Design

Research Hypotheses

Based on the literature review mentioned above, specific hypotheses for this study are as follows

H1: Critical thinking skills positively predict foreign language performance among high school foreign language learners.

H2: Critical thinking skills positively predict foreign language enjoyment among high school foreign language learners.

H3: Foreign language enjoyment positively predicts foreign language performance among high school foreign language learners.

H4: Foreign language enjoyment mediates the positive relationship between critical thinking skills and foreign language performance among high school students.

Participants

The data for this study was collected from the Regional Education and Health Examination Project of the Country a Basic Education Quality Monitoring and Collaborative Innovation Center. A stratified sampling method was employed to survey high school students in 53 schools in a city. After excluding invalid responses (including consistently patterned answers, obviously random answers, and more than 50% unanswered questions), a total of 4,113 valid samples were obtained. Among them, there were 2,106 male students (approximately 51.2%) and 2,007 female students (approximately 48.8%), with ages ranging from 18 to 20 years old.

Research Instruments

Critical Thinking Skills Inventory

Critical thinking skills encompass both critical thinking abilities and tendencies. In this study, we primarily focus on critical thinking tendencies and utilize the Chinese version of the California Critical Thinking Disposition Inventory (CTDI-CV). The inventory consists of seven dimensions: truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity.

Initially, a pre-test was conducted with 300 high school students to analyze the data. Based on the results, 30 items with good consistency reliability ($\alpha = 0.864$) and structural validity (CFI = 0.986; TLI = 0.958; $\chi^2 = 6.534$; $df = 2$; RMSEA = 0.052; SRMR = 0.017) were selected to form the Critical Thinking Disposition Inventory.

Examples of items include "I often reflect repeatedly on right or wrong in practice and experience" and "I enjoy exploring the origins and details of things." The questionnaire adopts a five-point Likert scale format where higher scores indicate stronger critical thinking abilities in participants.

Statistical analysis revealed satisfactory internal consistency reliability for the Critical Thinking Disposition Inventory (Cronbach's $\alpha=0.851$). Confirmatory factor analysis indicated good fit indices for the inventory (CFI=0.902>0.9; TLI=0.988>0.9; $\chi^2=7622.440$; df=384; RMSEA=0.068<0.08; SRMR=0.06<0.08), suggesting favorable structural validity of this instrument (Byrne, 2013).

Foreign Language Enjoyment Scale

The Chinese version of the Foreign Language Enjoyment Scale, developed by Li et al (2018), consists of three dimensions: individual enjoyment, teacher support, and classroom atmosphere. Through educational measurement procedures involving a pilot test with 30 participants, a pre-test with 300 participants, student interviews, and expert review, it was found that only individual enjoyment is the positive emotion experienced by high school students in relation to foreign language learning. Teacher support and classroom atmosphere were identified as factors influencing individual enjoyment.

Additionally, the Program for International Student Assessment (PISA) measures reading enjoyment using only individual enjoyment while considering teacher support and classroom atmosphere as factors influencing reading enjoyment. Therefore, this study selected the Individual Enjoyment subscale from the Foreign Language Enjoyment Scale to assess the pleasurable emotions experienced by high school foreign language learners such as "I enjoy learning English." The foreign language enjoyment test used a 5-point Likert scale format where higher scores indicate a stronger sense of pleasure experienced during foreign language learning.

Statistical results demonstrate ideal internal consistency reliability for the Individual Enjoyment subscale (Cronbach's $\alpha = 0.959$) and good construct validity (CFI = 0.996 > 0.90; TLI = 0.987 > 0.90; $\chi^2 = 58.114$; df = 2; RMSEA = .08; SRMR = .01 < .08) based on Byrne's criteria 2013.

Foreign Language Performance Test

The data for the foreign language performance test comes from students' final exam scores, which are uniformly designed and administered by the local educational research institute based on the "National Education Standard" and the content covered in this semester. The total score is 150 points, including listening (30 points), reading comprehension (40 points), language usage (45 points), and English writing (35 points). The exam duration is two hours. To ensure reliability and validity of the exam, no specific scope was defined prior to the test, and the exam content aligns with curriculum standards. Additionally, random selection of questions using AB versions was employed for confidentiality purposes. Strict examination discipline was maintained, along with standardized grading criteria. After the unified examination, collective grading sessions were conducted among secondary schools throughout the city while following a systematic workflow. Furthermore, a review process was implemented to double-check all scores after grading.

Control Variables

Given that demographic variables such as family socioeconomic status and gender can influence foreign language performance, this study considers them as control variables to ensure the accuracy of the research results. Gender is treated as a categorical variable, with females coded as 1 and males coded as 0. Family socioeconomic status is measured using three indicators: parental occupation, parental education level, and family wealth, following the measurement and scoring methods used in PISA. The composite scores are then transformed into standard scores with a mean of 0 and a standard deviation of 1 for analysis purposes.

Data Analysis Methods

The data analysis in this study consists of three steps. Firstly, using SPSS 22.0, descriptive statistics and correlation analyses will be conducted to understand the overall performance and the relationship between critical thinking skills, foreign language enjoyment, and foreign language performance among high school students. Secondly, controlling for family socioeconomic status and student gender, path analysis will be performed using Mplus 8.0 to examine whether foreign language enjoyment mediates the relationship between critical thinking skills and foreign language performance. The significance of the mediation effect will be tested using bootstrap methods with a 95% confidence interval that does not cross zero indicating statistical significance (Preacher & Hayes, 2008). Missing values will be handled using maximum likelihood estimation method in this study.

Research Findings

Descriptive Statistics and Correlation Analysis Results

To understand the overall performance of critical thinking skills and foreign language enjoyment among high school foreign language learners, we conducted descriptive statistical analysis first. The results showed that the mean value of critical thinking skills was 3.623 with a standard deviation of 0.469, while the mean value of foreign language enjoyment was 3.368 with a standard deviation of 1.003 (Table 1).

Table 1

Correlation analysis results

	Critical thinking skills	Foreign language enjoyment	Foreign language performance	Student gender	Family socioeconomic status
Critical thinking skills	-				
Foreign language enjoyment	.357**	-			
Foreign language performance	.247**	.342	-		
Student gender	-.058	.117**	.119**	-	
Family socioeconomic status	.240	.130	.320**	-.067**	-
Mean values	3.623	3.368	96.116	.488	-.019
Standard deviations	.469	1.003	26.239	.499	.715

**p<.01

These results indicate that students generally exhibit good levels of critical thinking skills and foreign language enjoyment.

Pearson correlation analysis revealed significant positive correlations at the 0.01 level between critical thinking skills and both foreign language enjoyment ($r = .357$) and foreign language performance ($r = .247$). Furthermore, there was a significant positive correlation at the 0.01 level between foreign language enjoyment and foreign language performance ($r = .342$). Additionally, critical thinking skills, foreign language enjoyment, and foreign language performance were all significantly correlated with family socioeconomic status and student gender at the 0.01 level; moreover, female students exhibited significantly lower levels of critical thinking skills compared to male students ($r = -.058$, $p < .01$) (Table 1).

Path Analysis Results

In this study, critical thinking skills were treated as the independent variable, foreign language enjoyment as the mediating variable, and foreign language performance as the dependent variable. Family socioeconomic status and student gender were included as control variables in the path analysis. The fit indices and estimation results of the model indicated a good fit ($\chi^2=119.82$, $df=2$, $CFI=0.915>0.9$, $TLI=0.90$, $RMSEA=0.074<0.08$, $SRMR=0.038<0.08$).

The path analysis results showed that after controlling for student gender and family socioeconomic status, critical thinking skills significantly positively predicted foreign language performance ($\beta=.157$, $p < .001$), confirming H1 hypotheses.

After including foreign language enjoyment in the model, the standardized regression coefficient of critical thinking skills on foreign language performance decreased but remained a significant positive predictor ($\beta=.092$, $p < .001$).

Additionally, critical thinking skills significantly positively predicted foreign language enjoyment ($\beta = .357, p = .001$), validating the H2 hypothesis, and foreign language enjoyment significantly further positively predicted foreign language performance ($\beta = .246, p = .001$), validating the H3 hypothesis.

According to Morten's standard (2012), the above path analysis results indicate that foreign language enjoyment partially mediates between critical thinking skills and foreign language performance, validating the H4 hypothesis. This study conducted a mediation effect test using bias-corrected Bootstrap method (with 2000 samples). The 95% confidence interval was [0.538-0.6428], which indicates a significant mediation effect of Foreign Language Enjoyment between Critical Thinking Skills and Foreign Language Performance. The indirect effect was 0.088, accounting for 35.92% of the total effect of critical thinking skills on foreign language performance.

Discussion

Critical Thinking Skills and Foreign Language Enjoyment among High School Learners

This study found that the overall level of critical thinking skills among high school foreign language learners was moderate ($3 < M = 3.623 < 4$), indicating that Chinese high school students possess a certain level of critical thinking ability. This finding is slightly different from previous research conclusions suggesting lower levels of critical thinking skills among Asian students (Song & McCarthy, 2018). Previous studies have indicated that Asian students, influenced by Confucian traditions, tend to show reverence for authority, prioritize harmony, and avoid conflict, which results in lower levels of critical thinking abilities (Chiu, 2009). Therefore, this study partially challenges the stereotype of low critical thinking abilities among Asian students and suggests that in the new era, Chinese high school students are no longer rigid thinkers when it comes to foreign language learning. They are capable of engaging in critical thinking processes with an open mindset, embracing diverse perspectives while actively expressing their own positions and viewpoints—consistent with findings from Wu's research 2023.

Furthermore, this study found that Chinese high school students experience a moderate level of enjoyment in foreign language learning ($3 < M = 3.368 < 4$), slightly lower than that of rural middle school students in China ($M = 3.83, SD = 0.73$) (Li & Wei, 2023), and fifth-grade students in Turkey ($M = 3.87, SD = 0.394$) (Ozer & Altay, 2021). This indicates that despite the continuous improvement in foreign language teaching at the high school level under the new college entrance examination system in China, the immense pressure from college entrance exams results in high school students experiencing prolonged periods of stress and anxiety which may undermine their sense of enjoyment during the process of foreign language learning.

The Relationship between Critical Thinking Skills, Foreign Language Enjoyment, and Foreign Language Performance among High School Foreign Language Learners

This study found that high school foreign language learners with higher levels of critical thinking skills also achieved correspondingly higher foreign language performance. This confirms the importance of critical thinking skills in foreign language learning, which is consistent with previous research findings (Heidari, 2020; Liang & Fung, 2021) and aligns with the assumptions of information-processing theory (Simon, 1979). According to the dual-dimensional structure model of critical thinking skills (Facione, 2011), individuals with higher levels of critical thinking tend to maintain a mindset characterized by truth-seeking, openness,

confidence, curiosity, maturity, and rationality during the learning process. This facilitates improvement in foreign language performance.

While previous studies have mostly focused on university-level foreign language learners, this study discovered that critical thinking skills also play a promoting role in high school foreign language learning. It deepens and expands upon previous research findings and provides empirical evidence and references for fostering critical thinking skills in foreign language teaching.

Furthermore, this study found a significant positive correlation between foreign language enjoyment and foreign language performance, which is consistent with previous research findings (Botes et al., 2022; Li Chengchen & Han Ye, 2022). However, previous studies have mainly focused on the positive effects of foreign language enjoyment on university-level language learning (Li Chengchen & Han Ye, 2022), with only a few studies investigating the emotions of enjoyment among middle school language learners (Li & Wei, 2023). There is scarce research on the emotions of enjoyment among high school language learners. This study discovered that feelings of enjoyment also play a promoting role for high school language learners and expands upon and complements previous research. According to the Control-Value Theory (Pekrun, 2006), individuals who experience feelings of enjoyment are more likely to perceive pleasure in their language learning experiences and possess a stronger sense of control over their learning process. Consequently, they are less likely to feel bored or fatigued during their language learning journey, which benefits their overall performance. This study's findings contribute new empirical evidence to the field of emotion research in second-language acquisition by demonstrating that feelings of enjoyment promote foreign language learning among high school students. It also responds to Shao et al.'s call for integrating emotion research into second-language acquisition studies.

Additionally, this study found a significant positive correlation between critical thinking skills and foreign language enjoyment, confirming the importance of critical thinking skills in academic emotions as supported by previous research findings (Aghajani & Gholamrezapour, 2019). However, past studies have focused primarily on the impact of critical thinking skills on academic emotions in other domains, such as engineering majors (Villavicencio, 2011), with only a few studies that explore the relationship between foreign language learners' critical thinking skills and negative emotions (such as anxiety) (Aghajani & Gholamrezapour, 2019). There is a lack of research investigating the relationship between critical thinking skills and positive emotions among foreign language learners. This study discovered a positive association between critical thinking skills and positive emotions such as enjoyment among high school foreign language learners, expanding upon previous research and providing empirical evidence for the application of rational-emotional theory in applied linguistics.

The Mediating Effect of Foreign Language Enjoyment between Critical Thinking Skills and Foreign Language Performance

The research findings indicate that foreign language enjoyment partially mediates the relationship between critical thinking skills and foreign language performance, thus confirming the assumptions of the rational-emotional theory. According to Ellis's ABC model in the rational-emotional theory (1991), emotions are not triggered by external factors but rather by individuals' thought processes. Critical thinking skills help stimulate positive emotions and alleviate negative ones. In the process of learning a foreign language, learners with higher critical thinking skills often possess strong curiosity and a thirst for knowledge, which leads to increased cognitive demands. These cognitive demands make learners

experience pleasure in their foreign language learning journey, ultimately benefiting their performance (Rezazadeh & Zarrinabadi, 2023). Individuals with high levels of critical thinking skills tend to have a growth mindset and can flexibly utilize cognitive resources to complete learning tasks, thereby triggering feelings of enjoyment (Puente-Díaz & Cavazos-Arroyo, 2017).

This study further deepens our understanding of the mechanism underlying the relationship between critical thinking skills and foreign language performance by demonstrating that foreign language enjoyment serves as an intermediate bridge linking these two variables. It highlights that fostering foreign language enjoyment is an important explanatory variable for individuals with critical thinking skills aiming to improve their foreign language performance. Additionally, previous studies have found that critical thinking skills can influence academic achievement through inducing negative academic emotions such as anxiety and despair (Villavicencio, 2011). This study reveals that positive academic emotions can also mediate this relationship. This expands upon previous research on using academic emotions as mediating variables while complementing studies on the mechanisms behind critical thinking skills and foreign language performance relationships.

Previous research has shown that negative emotions play a complete mediating role between critical thinking skills and academic achievement (ibid.), whereas this study finds that positive emotions play a partial mediating role. This difference may be attributed to the selection of different emotional variables in the two studies, indicating that positive and negative emotions might exhibit different mediation pathways under the influence of the same observed variable. Based on this, future research could compare path models between foreign language academic emotions and various observed variables to further explore potential mediating effects between them.

In summary, critical thinking skills have both direct and indirect effects on foreign language performance. This study proposes, for the first time using path analysis, the mediation chain of "critical thinking skills → foreign language enjoyment → foreign language performance," which has innovative significance in terms of content expansion, theoretical application, and methodological reference.

Firstly, this study reveals the indirect pathway through which critical thinking skills influence foreign language performance. It has a high research purpose, broad perspective, and novel angles. It not only complements and deepens previous studies but also provides empirical evidence and references for the implementation of national standards, guidelines, new curriculum standards for basic education, and ethical education curriculum standards.

Secondly, this study demonstrates that foreign language enjoyment promotes improvements in foreign language performance. It provides empirical evidence for the application of rational-emotional theory in our country's basic foreign language education field. This is of significant value in fostering positive emotions among students during foreign language teaching and fulfilling the fundamental task of moral character development.

Thirdly, this study adopts path analysis methodology to explore the relationship mechanism between critical thinking skills and foreign language performance based on large-scale data. It breaks through the limitations of previous studies that were confined to theoretical discussions without sufficient empirical research.

Conclusion

After controlling for student gender and family socioeconomic status, this study found that foreign language enjoyment partially mediates the relationship between critical thinking skills

and foreign language performance. This indicates that critical thinking skills and foreign language enjoyment are complementary and interconnected, providing a theoretical explanation for improving Chinese students' foreign language performance and offering valuable insights for foreign language education in China.

Firstly, critical thinking skills play an important role in foreign language learning. This highlights the importance of raising awareness among foreign language teachers about the cultivation of critical thinking skills, and enhancing their own abilities to incorporate critical thinking into their teaching through teacher training programs.

Secondly, foreign language enjoyment serves as a partial mediator between critical thinking skills and foreign language performance. This suggests that foreign language teachers should encourage students more often, provide positive feedback to stimulate their enjoyment of learning languages, enhance positive experiences during the process of learning languages, thereby improving their overall academic performance.

In summary, it is crucial for foreign language teachers to focus on developing both students' critical thinking skills and fostering positive emotions in order to maximize the effectiveness of second language acquisition. However, it should be acknowledged that this study has limitations such as its cross-sectional design, the potential bias introduced by self-reported measures, and limited scope in measuring critical thinking abilities. Future research could address these limitations by selecting more representative samples, and employing more rigorous methodologies, such as longitudinal studies.

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