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The impact of EFL learners' perceived teacher emotions on learning engagement: the mediating role of achievement emotions

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This study aims to investigate the influence of English major undergraduates' perceptions of their teachers' emotions on their learning engagement, while also examining the mediating role of achievement emotions in this relationship. Data were collected from 180 English major undergraduates through a questionnaire survey. Descriptive statistical analyses, correlation analyses, regression analyses, and mediation effect analyses were conducted using SPSS and SPSSPRO. The results revealed that perceived teacher enthusiasm is significantly and positively correlated with student engagement, whereas no significant correlation was found between teacher anger/anxiety and student engagement. Furthermore, foreign language enjoyment, boredom, and anxiety partially mediate the relationship between perceived teacher enthusiasm and student engagement. These findings have important implications for English major teaching practices, highlighting the crucial role of both teacher emotions and students' achievement emotions in language teaching. We also suggest potential directions for future research.

KEYWORDS

teacher emotions, student engagement, achievement emotions, second language acquisition, mediation effect analyses

1 Introduction

Emotions encompass a complex interplay of changes across various subsystems within an organism, including evaluations, personal experiences, physiological responses, emotional expressions, and behavioral tendencies. Emotions are now recognized as a crucial domain of mental processes, alongside motivation and cognition (Mayer et al., 2000). In educational contexts, emotions play a pivotal role in mediating key cognitive processes such as attention, memory, and problem-solving, while also exerting a significant influence on learners' engagement, motivation, and academic achievement (Fredrickson, 2001; Pekrun, 2006). In the field of second language acquisition (SLA) and applied linguistics, the traditional focus on cognition has hindered the exploration of emotions in language education (Agudo, 2018). Krashen (1982) affective filter hypothesis marked an

early attempt to study the role of affective variables. Early research primarily concentrated on negative emotions (Dewaele and MacIntyre, 2014), but recent studies influenced by positive psychology have included both negative and positive emotions (Dewaele, 2015). Despite this progress, research on teacher emotions remains limited and under-explored compared to studies on learners' emotions (Becker et al., 2014). Existing literature suggests that student and teacher emotions are interconnected through processes like emotional contagion (Keller and Becker, 2021), yet research in this area is still scant (Kong, 2022). Students' perception of teachers' emotions frequently diverges from teachers' self-reported feelings, as demonstrated by Keller et al. (2018), who revealed discrepancies between teachers' self-assessed emotional states and students' interpretations of these emotions. Various factors can influence students' interpretations, such as their personal emotional states, prior experiences with teachers, and cultural norms related to emotional expression. Consequently, the present study aims to delve deeper into students' perceptions of teachers, specifically focusing on their understanding and cognition of teachers' emotions. By doing so, we seek to gain insights into how these perceptions may shape learning environments and influence student outcomes. Previous research has highlighted the significant impact of students' perceptions of their teachers' emotions on their classroom experiences (Talebzadeh et al., 2020; Moskowitz and Dewaele, 2021). However, despite these findings, there remains a notable lack of empirical studies exploring the relationship between emotions and student engagement, particularly among undergraduate students (Dewaele and Li, 2021). To address this gap, the current study aims to examine the impact of English major undergraduate students' perceived teacher emotions on their engagement levels.

2 Literature review

2.1 Broad-and-build theory

Introduced by Barbara Fredrickson in 2001, the broaden-and-build theory (BBT) emphasizes the distinct yet complementary roles and impacts of both negative and positive emotions (Fredrickson and Branigan, 2005). According to BBT, positive emotions facilitate the development of enduring personal resources, encompassing social, psychological, and cognitive resources. These resources are resilient and can be tapped into to bolster coping strategies, enhance learning engagement, and foster long-term wellbeing. Conversely, negative emotions, such as fear, anger, and disgust, exhibit a narrowing effect, restricting individuals' attentional focus and cognitive resources, causing them to become fixated on threats or negative stimuli while overlooking broader contextual information. Furthermore, BBT underscores that positive emotions can counteract the physiological and psychological effects of negative emotions, accelerating recovery and providing a theoretical framework for research on emotional interactions (Wu and Kabilan, 2025).

MacIntyre and Gregersen (2012b) argue that positive emotions foster resource development by broadening individuals' perspectives, thereby enhancing their openness to acquiring

language. In contrast, negative emotions lead to a narrowing of attention, limiting the variety of linguistic input an individual can process. Therefore, achieving a balance between positive-broadening and negative-narrowing emotions in the language classroom is paramount. Teachers play a pivotal role in nurturing students' positive-broadening emotions, which in turn may facilitate more effective language learning (MacIntyre and Gregersen, 2012a). BBT presents a novel perspective, shifting the emphasis from merely observing the spontaneous emergence of emotions in the classroom to exploring how emotions can be effectively harnessed to facilitate cognitive processes and achieve educational goals.

2.2 Students' perceived teacher emotions

Emotional contagion theory posits that students can catch teachers' emotions, providing a foundation for exploring the relationship between students' perceived teacher emotions and achievement emotions in SLA. Emotional contagion, defined as experiencing another's emotions (Hatfield et al., 1993), involves primitive (automatic imitation) and conscious (conscious participation) forms, often combined (Barsade, 2002). Recent research in educational psychology highlights the intertwining of teachers' and students' emotions, with significant impacts on students' class achievement emotions (Frenzel et al., 2018; Mainhard et al., 2018). In SLA, studies have increasingly focused on the transmission of positive emotions, such as enjoyment (Talebzadeh et al., 2020). Matsumoto (2011) highlights a direct and positive correlation between students' perception of teachers' commitment to teaching and their motivation. Furthermore, Moskowitz and Dewaele (2021) demonstrate that students' perception of their teachers' happiness positively correlates with their overall attitude, motivation, and attitude toward the teacher. Positive teacher emotions, such as enthusiasm, contribute to higher student enjoyment and lower boredom, effectively mitigating negative learner psychology (Dewaele and Li, 2021). Wu et al. (2023) find that perceived teacher affective support and enjoyment foster grit in second language (L2) learners and negatively correlate with burnout. Additionally, Henry and Thorsen (2018) suggest that positive teacher-student relationships, shaped by positive teacher emotions, indirectly enhance academic performance.

Conversely, negative teacher emotions, like boredom, induce negative learner psychology and diminish learning motivation (Tam et al., 2020). However, existing studies primarily focus on the impact of perceived positive emotions, overlooking the potential consequences of negative emotions on student engagement. Dewaele and Li (2021) investigate the mediation effect of L2 enjoyment and boredom on the relationship between students' perceived teacher enthusiasm and their engagement, but this research confines its scope to social dimensions of engagement, neglecting other crucial dimensions.

Although existing research has established that students' perceptions of their teachers' emotional states influence their learning experiences, the precise pathways of these influences remain inadequately delineated. Specifically, the impact of negative teacher emotions on learners and the mechanisms through which

these effects occur lack clarity. Consequently, there is a notable gap in empirical research examining the relationship between perceived emotions of foreign language teachers and foreign language learning effectiveness.

Therefore, there is a pressing need for comprehensive empirical research to explore the multifaceted relationship between perceived emotions of foreign language teachers and foreign language learning effectiveness, encompassing both positive and negative emotional dimensions and their impacts on various aspects of student engagement. Such research would contribute significantly to our understanding of the complex interplay between teachers' emotions and students' learning outcomes in foreign language contexts.

2.3 Student engagement

Student engagement has garnered significant attention in educational research, evolving from a behavioral focus to a comprehensive framework encompassing behavioral, emotional, and cognitive components (Fredricks et al., 2004; Fredricks et al., 2016). This study adopts Fredricks' three-dimensional model, defining English learning engagement as high investment, commitment, and involvement in learning, accompanied by classroom affective responses and psychological investment. Fredricks et al.'s model has been widely accepted and expanded, incorporating dimensions such as academic, agentic, and social engagement (Appleton et al., 2006; Reeve and Tseng, 2011; Linnenbrink-Garcia et al., 2011). Self-report questionnaires, particularly the Utrecht Work Engagement Scale for Students (UWES-S), are primary evaluation tools (Schaufeli et al., 2002). Reeve and Tseng's (2011) four-dimensional scale, focusing on behavioral, agentic, and emotional engagement, was adopted for this study, demonstrating good validity, and reliability. Studies have shown that student engagement positively influences learning outcomes and is impacted by external (schools, teachers, peers, parents) and internal (learning emotions, prior knowledge, aptitude, personality, motivation) factors (Appleton et al., 2008; Zhang and Wang, 2023). Positive emotions, such as enjoyment, are also crucial, as they correlate with greater willingness to communicate and academic achievement (Dewaele et al., 2019; Botes et al., 2022).

2.4 Achievement emotions

Achievement emotions, directly related to achievement activities or outcomes, significantly impact motivation, learning, and performance (Pekrun, 2000). In foreign language classrooms, these emotions encompass experiences tied to learning activities and results (Shao et al., 2019). While past research focused on foreign language anxiety, recent studies advocate for a holistic view of achievement emotions (Dong, 2021). Meta-analyses indicate a moderate negative correlation between foreign language anxiety and academic performance among Chinese English learners (Dong, 2021). However, high levels of foreign language enjoyment are positively associated with academic achievement (Botes et al., 2022).

2.5 Relationships between students' perceived teacher emotions, achievement emotions, and student engagement

The relationships among students' perceptions of teacher emotions, achievement emotions, and student engagement have garnered significant attention in educational research, guided by robust theoretical frameworks. Prior studies have established that teacher-related factors, notably supportive teacher-student relationships, are crucially associated with behavioral and emotional engagement among students (Lee, 2012). This correlation has been extended to foreign language learning contexts, where perceived teacher-student relationships directly influence student engagement, with foreign language enjoyment functioning as a mediator in this process (Li, 2023). Yan et al. (2023) conducted an investigation among 358 college students in China, revealing a significant positive correlation between perceived teacher enthusiasm and student engagement. Similarly, Dewaele and Li (2021) examined 2002 English learners from 11 universities across China and corroborated this positive association.

However, research exploring the impact of teachers' emotions or students' perceptions of teacher emotions on engagement remains limited. Dewaele and Li (2021) revealed that perceived teacher enthusiasm fosters students' social-behavioral engagement, with student enjoyment and boredom acting as mediators in this relationship. Emotional contagion theory posits a connection between teacher and student emotions, as evidenced in math classes where teachers' enjoyment correlates positively with students' perceptions of teacher enthusiasm, which in turn is associated with students' enjoyment levels (Frenzel et al., 2018). Similarly, Amiri (2023) observed in Moroccan university settings that perceived teacher enjoyment and boredom predict students' enjoyment, whereas perceived teacher anxiety does not exhibit such an effect. This emotional interconnection is also apparent in English classrooms, where perceived emotional support from teachers and enjoyment are positively related to L2 grit and negatively associated with L2 learner burnout, with L2 grit serving as a mediator in this connection (Wu et al., 2023). Furthermore, happiness has been found to be contagious in language learning classrooms, positively influencing students' overall attitudes and motivation (Moskowitz and Dewaele, 2021).

Research also underscores the relationship between achievement emotions and engagement. Oga-Baldwin (2019) noted the impact of emotional elements, such as motivation, and educational settings, including teacher and peer relationships, on student involvement in foreign language learning, with mutual influences observed. The Control-Value Theory (Pekrun, 2006) further elucidates that students' achievement emotions are influenced by the environment and appraisal, affecting resources like motivation and strategies, ultimately impacting academic achievement. Positive achievement emotions, such as enjoyment and enthusiasm, are associated with higher engagement, whereas negative emotions, including boredom and anxiety, are linked to lower engagement (Li et al., 2023; Zhang et al., 2021). Empirical studies, such as those conducted by Tsang and Dewaele (2023), have confirmed these correlations, finding that both enjoyment and boredom can predict EFL children's engagement and proficiency.

However, there is a lack of empirical studies exploring the link between emotions and student engagement, particularly among undergraduate students (Dewaele and Li, 2021).

Feedback, as a critical environmental antecedent of students' mental states, influences their emotional experiences and engagement levels in learning contexts, irrespective of its source. Research underscores the interplay between individual factors, such as self-regulation, and environmental conditions, including peer and teacher support, technological infrastructure, and feedback mechanisms, in shaping students' emotional responses (Yang et al., 2021). Feedback, particularly when perceived positively, fosters emotions such as appreciation, gratitude, happiness, and pride, which are instrumental in promoting a constructive learning environment (Pitt and Norton, 2017). Rowe (2017) further emphasizes that feedback is a reciprocal process, with meaningful dialogue—central to effective feedback—hinging on robust student-teacher relationships.

However, the emotional impact of feedback is multifaceted. While positive feedback can enhance learning experiences, negative feedback may elicit emotions such as anxiety, shame, and embarrassment, which can adversely affect students' cognitive processing and engagement (Cramp et al., 2012; Thomas and Montgomery, 1998). Emotional events, including those triggered by feedback, tend to enhance memory retention, with positive emotions broadening attention and negative emotions narrowing it (Fredrickson, 2001; Huntsinger, 2013; Talmi, 2013). The type and intensity of emotions experienced by students in response to feedback can thus directly influence how they process, retain, and respond to it (Rowe, 2017). Empirical studies have demonstrated that feedback—whether delivered by teachers, peers, or automated systems—can promote student engagement when implemented effectively (Zhang and Hyland, 2022).

In recent years, the advent of generative artificial intelligence (AI) has revolutionized feedback mechanisms in education, offering advanced capabilities in natural language understanding and content generation (Liu et al., 2025). AI-generated feedback has been shown to reduce writing anxiety, improve writing performance, and enhance motivation and engagement in revision (Lo et al., 2025; Wang, 2024). However, the emotional valence and intensity of students' responses to AI feedback remain a subject of ongoing research, with mixed findings reported across studies. Despite these inconsistencies, there is a growing consensus that AI, as an environmental antecedent, influences students' emotional states and academic outcomes.

Collectively, these findings underscore the importance of understanding learners' emotional responses to instructional input, whether human or machine-mediated, in language learning contexts. Designing effective, empathetic, and engaging feedback systems that account for these emotional dynamics is crucial for optimizing learning outcomes in both traditional and AI-augmented classrooms.

2.6 Research questions

This study aims to explore the interrelations among English major undergraduates' perceived teacher emotions, achievement emotions, and student engagement. Specifically, it seeks to address the following research questions:

(1) Are there significant correlations among undergraduates' perceived teacher emotions, achievement emotions, and student engagement among English major undergraduates?

(2): If so, what is the mediating role of achievement emotions in the relationship between undergraduates' perceived teacher emotions and student engagement?

3 Methodology

3.1 Participants

A total of 180 sophomore, junior, and senior students majoring in English, aged 18–23 (Female = 162, Male = 18), from four science and engineering universities in Beijing participated in this study. Demographic information, including major, university, gender, and age, was collected.

3.2 Instruments

The survey comprised four sections. Responses were measured using five-point Likert scales ranging from “strongly disagree” to “strongly agree,” based on previously validated measures (Supplementary Appendix).

Section 1: Collected basic demographic data (gender, major, age, grade).

Section 2: Assessed students' perceived teacher emotions (enthusiasm, anger, anxiety). Enthusiasm was measured with four items from Frenzel et al. (2009). Anger and anxiety were assessed using slightly modified statements from the Teacher Emotions Scales (TES) by Frenzel et al. (2016). Cronbach α -values were 0.785, 0.794, and 0.886, respectively, indicating satisfactory internal consistency. The KMO value of the scale was 0.837, and Bartlett's test of sphericity was significant ($p < 0.05$), indicating that the data were suitable for factor analysis. Confirmatory factor analysis (CFA) was conducted. The construct reliability (CR) values for all three factors exceeded 0.7, indicating that the items within each factor consistently measured the intended constructs. The fit indices of CFA ($\chi^2/df = 2.453$, GFI = 0.895, RMSEA = 0.099, RMR = 0.081, CFI = 0.934, NFI = 0.895, NNFI = 0.911) is acceptable. Therefore, the three dimensions of the scale demonstrated good construct validity.

Section 3: Measured students' achievement emotions (boredom, enjoyment, anxiety). Anxiety was assessed using Dewaele and MacIntyre's (2014) 8-item FLCAS. Enjoyment was evaluated with the Chinese version of the Foreign Language Enjoyment Scale (Li et al., 2018). Boredom was measured using Dewaele and Li's (2021) three-item scale. Cronbach α values were 0.865, 0.806, and 0.915, respectively. The KMO value was 0.877, and the Bartlett's spherical test was significant ($p < 0.05$). The CR values of CFA for all three factors exceeded 0.7. The fit indices of CFA ($\chi^2/df = 2.713$, GFI = 0.739, RMSEA = 0.108, RMR = 0.086, CFI = 0.815, NFI = 0.739, NNFI = 0.793) is acceptable.

Section 4: Measured student engagement using 14 items from Reeve and Tseng (2011) scale, covering behavioral, agentic, and emotional engagement (5, 5, and 4 items, respectively). Cronbach α was 0.873. The KMO value was 0.923, and the Bartlett's spherical

test was significant ($p < 0.05$). The CR values of CFA for all three factors of behavioral engagement, agentic engagement, and emotional engagement were higher than 0.7 suggesting good construct validity. The fit indices of CFA ($\chi^2/df = 2.081$, GFI = 0.898, RMSEA = 0.086, RMR = 0.085, CFI = 0.943, NFI = 0.898, NNFI = 0.930) is acceptable. Therefore, the scale demonstrated good construct validity.

3.3 Data collection and analysis

Questionnaires were designed and distributed online utilizing the Wenjuanxing platform. Prior to their formal dissemination, a pilot study was conducted to assess their feasibility and reliability. This pilot study involved 25 participants, from whom 25 completed questionnaires were collected. The Cronbach's α coefficients for the various scales were. Prior to their formal dissemination, a pilot study was conducted to assess their feasibility and reliability. This pilot study involved 98, 0.873, 0.903, 0.957, 0.726, 0.881, and 0.935, respectively. These values suggest good internal consistency and reliability of the measurement instruments. Subsequently, feedback was gathered from the pilot study participants regarding their suggestions for improving the questionnaires. Based on this feedback, minor modifications were made to the questionnaire instructions to clarify the selection of the English teacher, specifically adding the instruction: "If there are multiple teachers for the course, please choose the one who made the most impression on you." This adjustment was made in response to participant feedback indicating that courses might be taught by different instructors. After incorporating these refinements, the questionnaire was formally administered to a broader sample of participants.

A total of 180 valid questionnaires were analyzed using SPSS and SPSSPRO to investigate the relationships between perceived teacher emotions, achievement emotions, and student engagement. Initially, basic statistical characteristics were examined, followed by correlation analyses utilizing Pearson's correlation coefficients to assess the strength and direction of relationships among the variables. Subsequent regression analyses explored predictive relationships, focusing specifically on whether teacher and achievement emotions significantly predicted student engagement.

To further elucidate the underlying mechanisms, mediation effect analyses were conducted, employing path analysis to model both direct and indirect effects of perceived teacher emotions on student engagement, with achievement emotions acting as the mediator. Bootstrapping statistical tests were utilized to ascertain the significance of indirect paths and to estimate confidence intervals for the mediation effect, thereby clarifying the role of achievement emotions as a conduit between the emotional climate established by teachers and student engagement levels in the classroom.

To enhance the rigor and transparency of our study, several additional steps were taken. Data were scrutinized for outliers and anomalies using statistical methods such as boxplots and z-scores to ensure that our findings were not biased. Robustness checks were also conducted by re-running the regression models using different subsets of the data and alternative specifications. The consistency of our results across these analyses underscores the

robustness of our findings. Detailed descriptions of the statistical methods and software utilized were provided to enable readers to evaluate the validity and reliability of our findings and to replicate the analysis if necessary.

4 Results and discussion

4.1 Correlations among perceived teacher emotions, achievement emotions, and student engagement

Before conducting correlation analyses on the parameters, skewness and kurtosis tests were performed to confirm the normal distribution of the variables in question. [Lei and Lomax \(2005\)](#) suggest that if skewness and kurtosis values fall within acceptable ranges ($|\text{skewness}| < 2$, $|\text{kurtosis}| < 2$), the data distribution could be considered approximately normal for many statistical procedures. Moreover, the central limit theorem provides reassurance that, for large sample sizes (typically $n > 30$), the sampling distribution of various statistics, including the Pearson correlation coefficient, tends to approximate a normal distribution. This theorem underscores the robustness of parametric tests like the Pearson correlation in large samples. In our preliminary analysis, we focused on assessing linear relationships between variables using the Pearson correlation coefficient, which offers a straightforward measure of both strength and direction, making it easy to interpret and communicate. Despite potential non-normality, our large sample size and consistent skewness/kurtosis values with theoretical expectations supported the use of the Pearson correlation. Consequently, Pearson correlation analysis was deemed appropriate and carried out. The findings are presented in [Table 1](#).

4.1.1 Correlation and regression analysis of perceived teacher emotions and student engagement

The correlation between perceived teacher enthusiasm and student engagement is significant at $p < 0.01$, with a moderate positive correlation coefficient of $r = 0.416$. In contrast, perceived teacher anger and anxiety do not exhibit significant correlations with student engagement ($p > 0.05$ and $p > 0.01$, respectively). These findings suggest that students' engagement is positively associated with their perception of teacher enthusiasm but largely unaffected by negative teacher emotions. Students who perceive their teachers as passionate and enthusiastic tend to experience greater enjoyment and reduced levels of anxiety and boredom in the classroom. This aligns with previous research which has established correlations between teacher enthusiasm and positive emotional outcomes, such as enjoyment and intrinsic motivation, as well as inverse correlations with negative emotional outcomes, like boredom ([Dewaele and Li, 2021](#); [Cui et al., 2017](#); [Yan et al., 2023](#); [Bieg et al., 2022](#); [Patrick et al., 2000](#)). These findings offer further support for the emotional contagion phenomenon within English language classrooms, confirming that students are capable of recognizing and responding positively to their teachers' positive emotions, thereby contributing to their own emotional wellbeing ([Talebzadeh et al., 2020](#)). Moreover, the study underscores that

TABLE 1 Descriptive statistics and correlations between the variables.

Variables	1	2	3	4	5	6	7
1. Perceived teacher enthusiasm							
2. Perceived teacher anger	−0.059						
3. Perceived teacher anxiety	−0.178**	0.658***					
4. FLE	0.424 ***	0.002	−0.087				
5. FLB	−0.433***	0.073	0.256***	−0.689***			
6. FLA	−0.209**	0.094	0.206**	−0.43***	0.508***		
7. Student engagement	0.416***	0.156*	0.058	0.738***	−0.585***	−0.428***	
Mean	4.218	1.718	1.71	3.865	2.103	2.624	3.478
SD	0.656	0.927	0.894	0.736	1.021	0.783	0.835
Skewness	−0.756	1.369	1.65	−0.404	0.881	−0.113	−0.241
Kurtosis	0.097	1.164	2.42	−0.635	0.076	−0.926	−0.486

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

positive emotions exhibited by language teachers have a moderating effect on students' negative achievement emotions (Wang et al., 2020), reinforcing the significance of teacher emotions in shaping the classroom learning environment.

What is noteworthy is the absence of a significant correlation between teachers' anger and anxiety and student engagement, which stands in contrast to prior research indicating that teacher anger adversely impacts students (Sutton and Wheatley, 2003). One plausible explanation for this discrepancy could be that university instructors employ effective emotion regulation strategies to manage negative emotions, such as anger, thereby mitigating their potential influence on teaching practices (Deng et al., 2022). Consequently, students' perception of teachers' negative emotions may be attenuated. This is further supported by the relatively low mean score for perceived teacher anger, suggesting that teachers infrequently express anger in the classroom and strive to foster a positive learning environment. As a result, students' overall emotional experience is infrequently swayed by teachers' anger. Another potential factor to consider is the overall classroom environment and atmosphere, particularly the teacher-student and student-student relationships, which may significantly influence students' emotional responses. In a positive and inclusive classroom climate, students may feel emotionally supported and resilient, enabling them to cope with occasional negative emotions expressed by teachers. Additionally, students' coping mechanisms are also influential. The participants in the present study, being university students, typically possess heightened levels of motivation for language learning and self-regulation abilities. These attributes may contribute to enhanced psychological resilience when confronted with sporadic negative emotions displayed by teachers in the classroom. Consequently, they are less inclined to exhibit excessive emotional reactions or fluctuations in engagement. To summarize, the findings of this study challenge previous assumptions regarding the impact of teachers' anger on student engagement and highlight the potential role of emotion regulation strategies, classroom environment, and students' coping mechanisms in shaping their emotional experiences and engagement levels.

The predictive power of perceived teacher enthusiasm on student engagement is further confirmed by regression analysis, as shown in Table 2 ($F = 30.826$, $p < 0.01$). The model demonstrates

no multicollinearity issues, with a Variance Inflation Factor (VIF) value below 10. The regression coefficient of 0.53 indicates that teacher enthusiasm significantly and positively predicts student engagement. Thus, students who perceive higher levels of teacher enthusiasm tend to exhibit greater engagement in class.

The findings presented herein align with the conclusions derived from prior research (e.g., Yan et al., 2023; Dewaele and Li, 2021), which consistently underscores the positive predictive relationship between teacher enthusiasm and student engagement. Collectively, these studies contribute to the growing body of evidence that emphasizes the crucial role of enthusiastic teaching in fostering student engagement. When educators exhibit genuine enthusiasm and passion for their subject matter, it serves as a powerful catalyst, motivating students to become more involved and committed to the learning process. This phenomenon transcends cultural and educational contexts, as evidenced by the consistent findings.

4.1.2 Correlation and regression analysis of perceived teacher emotions and achievement emotions

Table 1 reveals significant correlations between perceived teacher enthusiasm and foreign language enjoyment ($r = 0.424$, $p < 0.01$), boredom ($r = -0.433$, $p < 0.01$), and anxiety ($r = -0.209$, $p < 0.01$). Specifically, enthusiastic teachers are associated with higher levels of enjoyment and lower levels of boredom and anxiety among English major undergraduates. Conversely, students who perceive their teachers as less enthusiastic experience higher levels of boredom and anxiety.

Perceived teacher anger does not significantly correlate with students' achievement emotions ($p > 0.1$), possibly due to the overall positive classroom environment mitigating the impact of teachers' anger. The low mean score for perceived teacher anger suggests that teachers rarely express this emotion in class, contributing to a positive learning atmosphere.

Perceived teacher anxiety positively correlates with foreign language boredom ($r = 0.256$, $p < 0.01$) and anxiety ($r = 0.206$, $p < 0.05$) but not with enjoyment ($p > 0.1$). These findings suggest that teacher anxiety can contribute to students' feelings of disengagement and unease during language learning activities.

TABLE 2 Regression analysis of perceived teacher enthusiasm and student engagement.

	<i>B</i>	<i>t</i>	<i>P</i>	VIF	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Constant	1.243	3.05	0.003***		0.173	0.168	<i>F</i> = 30.826***
Perceived teacher enthusiasm	0.530	5.552	0.000***	1			

Dependent variable, student engagement. **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

TABLE 3 Regression analysis of perceived teacher emotions and foreign language boredom.

	<i>B</i>	<i>t</i>	<i>P</i>	VIF	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Constant	0.844	1.937	0.055*		0.211	0.19	<i>F</i> = 10.096***
Perceived teacher enthusiasm	−0.385	−3.038	0.003***	1.037			
Perceived teacher anxiety	0.46	3.477	0.001***	2.106			

Dependent variable, foreign language boredom. **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

TABLE 4 Regression analysis of perceived teacher emotions and foreign language anxiety.

	<i>B</i>	<i>t</i>	<i>P</i>	VIF	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Constant	3.262	7.25	0.000***	—	0.073	0.061	<i>F</i> = 5.765***
Perceived teacher enthusiasm	−0.213	−2.203	0.029**	1.033			
Perceived teacher anxiety	0.152	2.151	0.033**	1.033			

Dependent variable, foreign language anxiety. **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

Table 3 presents the results of regression analysis, revealing significant predictive power for both perceived teacher enthusiasm and anxiety on foreign language boredom (*p* < 0.01). The model exhibits no multicollinearity issues, with VIF values below 10.

The regression coefficient for perceived teacher enthusiasm is specifically −0.385, indicating a negative predictive relationship with foreign language boredom. This finding suggests that as perceived teacher enthusiasm increases, student boredom decreases during language learning activities. In other words, teacher enthusiasm functions as a mitigating factor in alleviating student boredom.

Conversely, the regression coefficient for perceived teacher anxiety is 0.46, signifying a positive predictive relationship with foreign language boredom. This implies that heightened levels of perceived teacher anxiety are associated with increased student boredom during language learning, potentially contributing to a less conducive learning environment and exacerbating feelings of disengagement and disinterest among students.

Table 4 presents the results of the regression analysis examining the relationship between perceived teacher emotions and foreign language anxiety. Both perceived teacher enthusiasm and anxiety demonstrate significant predictive power (*p* < 0.05, VIF < 10). Notably, perceived teacher enthusiasm negatively predicts the level of foreign language anxiety ($\beta = -0.213$). This suggests that higher levels of perceived teacher enthusiasm are associated with reduced student foreign language anxiety, potentially creating a more comfortable and supportive learning environment that mitigates anxiety in language learning.

The regression coefficient for perceived teacher anxiety, which stands at 0.152, indicates a positive predictive relationship with the level of foreign language anxiety among students. This finding implies that heightened levels of perceived teacher anxiety are correlated with an increase in student foreign language anxiety. The manifestation of teacher anxiety may inadvertently create

an atmosphere of embarrassment in the classroom, potentially deterring student engagement and participation.

The regression analysis presented in Table 5 reveals that perceived teacher enthusiasm has a significant and positive predictive effect on English major undergraduates' foreign language enjoyment (*p* < 0.01, $\beta = 0.476$, VIF < 10). This suggests that when teachers demonstrate enthusiasm and passion in the classroom, students are more inclined to experience enjoyment and satisfaction in the language learning process.

The findings of this study provide further confirmation of the emotional contagion phenomenon within English language classrooms. Prior research by Becker et al. (2014) has demonstrated that teacher emotions have predictive power over student emotions in general educational contexts. Specifically, in language learning environments, Moskowitz and Dewaele (2021) collected data from 129 adult ESL/EFL students worldwide and found that students' perceptions of teacher satisfaction and happiness were significantly and positively correlated with their attitudes and motivations. Similarly, Talebzadeh et al. (2020) not only identified the correlation of foreign language enjoyment contagion between teachers and students but also elucidated the primary mechanism of enjoyment contagion. While the transmission of positive emotions in language classrooms is well-documented, it is crucial to acknowledge that negative teacher emotions can also be contagious. Although research on negative emotion contagion in language teaching contexts is limited, previous studies, such as that by Gurin et al. (2017), have shown that teachers' math anxiety can be transmitted to students, increasing their math anxiety. The findings of this study confirm that the negative emotions of English teachers can potentially impact students' emotional experiences in the classroom.

This phenomenon of emotional transmission underscores the pivotal role of teacher emotions in language classrooms and emphasizes the importance of fostering a positive and supportive

TABLE 5 Regression analysis of perceived teacher enthusiasm and foreign language enjoyment.

	<i>B</i>	<i>t</i>	<i>P</i>	VIF	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Constant	1.857	5.187	0.000***		0.18	0.174	<i>F</i> = 32.253***
Perceived teacher enthusiasm	0.476	5.679	0.000***	1			

Dependent variable, foreign language enjoyment. **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

TABLE 6 Regression analysis of achievement emotions and student engagement.

	<i>B</i>	<i>t</i>	<i>P</i>	VIF	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Foreign language boredom	−0.478	−8.735	0.000***	1	0.342	0.337	<i>F</i> = 76.294***
Foreign language anxiety	−0.457	−5.747	0.000***	1	0.183	0.178	<i>F</i> = 33.028***
Foreign language enjoyment	0.837	13.253	0.000***	1	0.544	0.541	<i>F</i> = 175.638***

Dependent variable, student engagement. **p* < 0.1, ***p* < 0.05, ****p* < 0.01.

emotional climate. By recognizing and addressing the emotional dynamics within the classroom, teachers can create an inclusive and conducive learning environment where students feel motivated, engaged, and supported in their language learning journey.

4.1.3 Correlation and regression analysis of achievement emotions and student engagement

The results presented in Table 1 indicate that all achievement emotions exhibit a significant correlation with student engagement (*p* < 0.01). Foreign language boredom displays a moderate-to-high negative relationship with student engagement (*r* = |−0.585| < 0.7), suggesting that when English major undergraduates experience boredom in their English learning activities, they are less likely to actively engage and invest energy in class. Foreign language anxiety demonstrates a low-to-moderate negative relationship with student engagement (*r* = |−0.428| < 0.5), indicating that anxiety in English learning endeavors may adversely affect students' levels of engagement in class activities. In contrast, foreign language enjoyment has a high correlation with student engagement (*r* = |0.738| > 0.7), implying that English major undergraduates with high levels of foreign language enjoyment tend to concentrate more and invest more energy in class.

The correlation analysis has established a relationship between foreign language boredom, anxiety, enjoyment, and student engagement. To further explore the predictive power of these achievement emotions, regression analysis was conducted. The results presented in Table 6 reveal that all achievement emotions have significant predictive power on student engagement (*p* < 0.01). Specifically, foreign language boredom (*B* = −0.478) and anxiety (*B* = −0.457) negatively predict student engagement, while foreign language enjoyment (*B* = 0.837) demonstrates strong positive predictive power. These findings suggest that when English major undergraduates experience higher levels of boredom and anxiety in their studies, they allocate less attention and effort to class activities. Conversely, when they derive enjoyment from learning English, they invest more effort and attention into their English language studies.

The results obtained confirm the nexus between achievement emotions and student engagement. However, Tsang and Dewaele (2023) study reveals a nuanced finding: only foreign language enjoyment positively predicts student engagement,

whereas anxiety and boredom exhibit no correlation with engagement. Their findings lend support to the universal pattern linking foreign language enjoyment to engagement. The authors attribute the absence of a correlation between foreign language anxiety/boredom and engagement to the fact that their samples comprised primary school students, who may not have yet developed fully mature abilities to recognize their negative emotions and could be less likely to perceive classes as boring, thus resulting in active participation despite occasional feelings of anxiety or boredom. Conversely, the participants in the present study are college students who have experienced this anxiety for a long time and are potentially capable of identifying their anxieties as well as recognizing feelings of boredom in classroom settings. Consequently, these negative emotions hinder their dedication and energy toward class activities.

4.2 The mediating role of achievement emotions in the relationship between perceived teacher emotions and student engagement

Previous sections have established significant relationships among perceived teacher enthusiasm, student engagement, foreign language boredom, foreign language enjoyment, and foreign language anxiety. Further analyses have demonstrated the predictive power of perceived teacher enthusiasm on student engagement, foreign language enjoyment, boredom, and anxiety, as well as the predictive effects of foreign language enjoyment, boredom, and anxiety on student engagement. To test the mediation effects of foreign language enjoyment, boredom, and anxiety, the current study employs the Bootstrap method (Preacher and Hayes, 2004). The results are detailed in the subsequent section.

4.2.1 Mediation effect of foreign language enjoyment

In the first mediation model, perceived teacher enthusiasm serves as the independent variable, student engagement as the dependent variable, and foreign language enjoyment as the mediator. Table 7 presents the results of multiple regression

TABLE 7 Mediation through foreign language enjoyment (standardized coefficient β).

	Student engagement	Foreign language enjoyment	Student engagement
Perceived teacher enthusiasm	0.416 ***($t = 5.552$)	0.424 ***($t = 5.679$)	0.126 **($t = 2.074$)
Foreign language enjoyment			0.684*** ($t = 11.256$)
R^2	0.173	0.18	0.557
Adj R^2	0.168	0.169	0.548
F	$F = 30.826^{***}$	$F = 32.253^{***}$	$F = 91.94^{***}$

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 8 Results of the test on mediating effect of foreign language enjoyment.

Pathway	Direct effect (c')	Indirect effect ($a*b$)	95% BootCI	Rate
PTE \rightarrow FLE \rightarrow SE	0.126**	0.290***	[0.217, 0.531]	69.712%

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. PTE, Perceived teacher emotions; FLE, Foreign language enjoyment; SE, student engagement.

analyses among these variables. The findings indicate that teachers' enthusiasm significantly and positively predicts overall student engagement, with a path coefficient of 0.416 ($p < 0.01$), in the absence of the mediator (foreign language enjoyment). Upon introducing the mediator, the path coefficient of foreign language enjoyment to overall student engagement is 0.684 ($p < 0.01$), while the path coefficient of teachers' enthusiasm to overall student engagement decreases to 0.126 ($p < 0.01$). Additionally, the path coefficient for teachers' enthusiasm to foreign language enjoyment is 0.424 ($p < 0.01$).

As shown in Table 8, the 95% confidence interval ranges from 0.217 to 0.513, and the total mediation effect is 0.290, accounting for 69.712% of the total effect. These parameters collectively suggest that foreign language enjoyment partially mediates the relationship between perceived teacher enthusiasm and student engagement. Therefore, Figure 1 illustrates the influence path of perceived teachers' enthusiasm, foreign language enjoyment, and student engagement.

4.2.2 Mediation effect of foreign language boredom

Mediation Model 2 investigates the intricate relationship among perceived teacher enthusiasm, student engagement, and foreign language boredom. The results of multiple regression analyses involving these variables are presented in Table 9.

In the absence of the mediator, foreign language boredom, perceived teacher enthusiasm significantly and positively predicts total student engagement, with a robust path coefficient of 0.416 ($p < 0.01$). Upon introducing the mediator, the path coefficient from foreign language boredom to total student engagement reveals a significant negative predictive power, amounting to -0.498

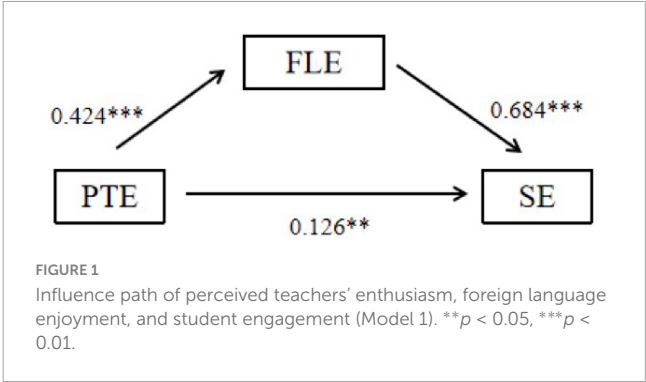


TABLE 9 Mediation through foreign language boredom (standardized coefficient β).

	Student engagement	Foreign language boredom	Student engagement
Perceived teacher enthusiasm	0.416 ***($t = 5.552$)	-0.433 ***($t = 5.829$)	0.201 ***($t = 2.765$)
Foreign language boredom			-0.498^{***} ($t = -6.850$)
R^2	0.173	0.18	0.557
Adj R^2	0.168	0.177	0.361
F	$F = 30.826^{***}$	$F = 33.973^{***}$	$F = 43.692^{***}$

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 10 Results of the test on mediating effect of foreign language boredom.

Pathway	Direct effect (c')	Indirect effect ($a*b$)	95% BootCI	Rate
PTE \rightarrow FLB \rightarrow SE	0.201***	0.216***	[0.157, 0.420]	51.923%

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. PTE, Perceived teacher emotions; FLB, Foreign language boredom; SE, student engagement.

($p < 0.01$). Concurrently, the direct path coefficient from teachers' enthusiasm to total student engagement diminishes to 0.201 ($p < 0.01$). Furthermore, our analysis reveals a significant negative correlation between teachers' enthusiasm and students' foreign language boredom, with a path coefficient of -0.433 ($p < 0.01$). This finding indicates that, when controlling for other variables in the model, an increase of one unit in teacher enthusiasm is associated with an average decrease of 0.433 units in students' foreign language boredom. The path coefficient quantifies the direct impact of teacher enthusiasm on student boredom, confirming the existence of a negative relationship between these two variables.

As depicted in Table 10, the 95% confidence interval for the mediation effect spans from 0.157 to 0.420, encompassing a total mediation effect of 0.216. This mediated effect accounts for a substantial proportion (51.923%) of the overall influence of teachers' enthusiasm on student engagement. Figure 2 visually illustrates the influence pathway encompassing perceived teacher enthusiasm, foreign language boredom, and student engagement.

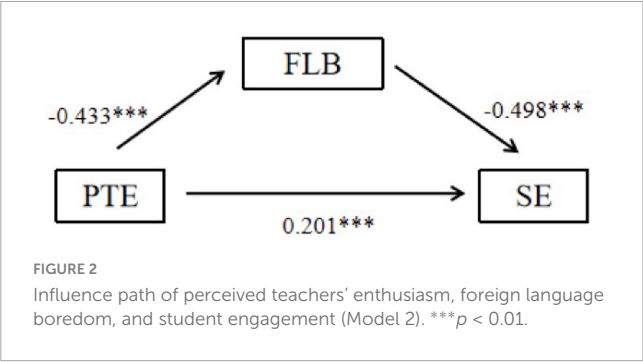


TABLE 11 Mediation through foreign language anxiety (standardized coefficient β).

	Student engagement	Foreign language anxiety	Student engagement
Perceived teacher enthusiasm	0.416 ***(<i>t</i> = 5.552)	−0.209 **(<i>t</i> = 2.596)	0.342 *** (<i>t</i> = 4.808)
Foreign language anxiety			−0.357***(<i>t</i> = 5.021)
<i>R</i> ²	0.173	0.044	0.295
Adj <i>R</i> ²	0.168	0.031	0.280
<i>F</i>	<i>F</i> = 30.826***	<i>F</i> = 6.737**	<i>F</i> = 30.557***

p* < 0.1, *p* < 0.05, ****p* < 0.01.

TABLE 12 Results of the test on mediating effect of foreign language anxiety.

Pathway	Direct effect (<i>c'</i>)	Indirect effect (<i>a*b</i>)	95% BootCI	Rate
PTE→FLA→SE	0.342***	0.074**	[0.021, 0.187]	17.788%

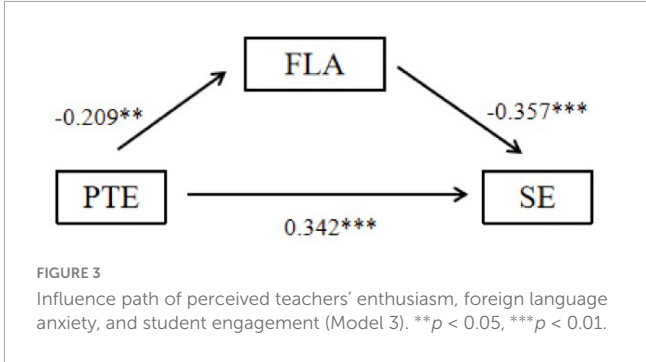
p* < 0.1, *p* < 0.05, ****p* < 0.01. PTE, Perceived teacher emotions; FLA, Foreign language anxiety; SE, student engagement.

These findings contribute to a deeper understanding of the complex interplay among teacher enthusiasm, student engagement, and foreign language boredom, with implications for educational practices and interventions aimed at enhancing learning outcomes in foreign language contexts.

4.2.3 Mediation effect of foreign language anxiety

Model 3 delves into the relationship between perceived teacher enthusiasm, student engagement, and foreign language anxiety. The results of multiple regression analyses involving these variables are presented in Table 11.

Consistent with the findings in sections 4.2.1 and 4.2.2, the path coefficient between perceived teacher enthusiasm and total student engagement is 0.416 (*p* < 0.01). The path coefficient from foreign language anxiety to total student engagement is −0.357 (*p* < 0.01), indicating a significant negative predictive power. Upon introducing foreign language anxiety as a mediator, the direct path coefficient from teachers' enthusiasm to total student engagement decreases to 0.342 (*p* < 0.01). Additionally, teachers' enthusiasm



exhibits a significant negative correlation with foreign language anxiety, with a path coefficient of −0.209 (*p* < 0.05).

As displayed in Table 12, the 95% confidence interval for the mediation effect ranges from 0.021 to 0.187. The direct effect of teachers' enthusiasm on student engagement is 0.342, while the total mediation effect is 0.074, accounting for 17.788% of the overall influence. Figure 3 visually represents the influence pathway encompassing perceived teachers' enthusiasm, foreign language anxiety, and student engagement.

Models 1, 2, and 3 collectively demonstrate that perceived teacher enthusiasm not only exerts a direct positive influence on student engagement but also indirectly affects it through the mediators of foreign language enjoyment, boredom, and anxiety. Teachers' happiness, enthusiasm, and humor provide English major undergraduates with engaging and enjoyable learning experiences, fostering active behavioral, and emotional participation in class. Teacher enthusiasm further influences student engagement by alleviating feelings of foreign language boredom and anxiety. In essence, part of the impact of teacher emotions is realized through their contagion to student emotions.

These findings contribute to the existing research, which has primarily focused on the connections between teacher and student emotions, and between achievement emotions and student engagement. By exploring the relationships among teacher emotions, achievement emotions, and student engagement, our study further validates the control-value theory. Teacher enthusiasm fosters a positive learning environment and serves as an external control factor, shaping students' beliefs about their control over learning tasks. Positive emotional responses from teachers enhance students' perceptions of control over their learning outcomes, thereby increasing their engagement. Foreign language enjoyment, boredom, and anxiety can be considered internal value factors related to the task, influencing students' beliefs about the task's value. Enjoyment leads to a more positive perception of the task's value, fostering engagement, whereas boredom and anxiety diminish the task's perceived value, reducing engagement. Ultimately, both external control and internal value factors influence student engagement levels.

Furthermore, our findings underscore the existence of emotional contagion, particularly positive emotional contagion such as enjoyment, in L2 classrooms. Conversely, foreign language boredom and anxiety may stem from a lack of emotional connection or contagion with the teacher's enthusiasm. This emotional contagion ultimately impacts student learning outcomes and teaching effectiveness, highlighting the pivotal role of teacher

emotions in emotion research within SLA. These insights offer valuable implications for educational practices and interventions aimed at enhancing student engagement and learning outcomes in foreign language contexts.

The findings also emphasize the irreplaceable role of teachers in the era of digital transformation, even as generative AI is poised to play an increasingly prominent role in education. Although generative AI is found to enhance students' engagement and performance, the impact of generative AI feedback on learners' emotional states remains complex. For instance, while students receiving AI-generated feedback may experience a greater reduction in writing anxiety compared to those who receive feedback from teachers (Wang, 2024), other study suggests that such feedback does not necessarily lead to improved writing outcomes via emotional mechanisms, and students' emotional responses to AI feedback are not consistently positive (Lo et al., 2025). In other words, the emotional interaction between teachers and students remains both unique and indispensable. The human touch—characterized by genuine emotional connection, spontaneous empathy, and personalized encouragement—cannot be fully replicated by current AI systems. Teachers' enthusiastic and supportive emotional feedback plays a crucial role in enhancing students' enjoyment of foreign language learning, reducing anxiety and boredom, and ultimately fostering deeper engagement. This classroom emotional pathway, as demonstrated by the current study, highlights the essential role of teacher affect in creating a supportive learning atmosphere. It suggests that while AI can serve as a valuable tool for providing timely and organized feedback, human instruction and human interaction is still the core of foreign language classroom.

5 Conclusion, implications, and future directions

This study delves into the intricate relationships among perceived teacher emotions, achievement emotions, and student engagement among English major undergraduates. The findings reveal a significant positive correlation between perceived teacher enthusiasm and student engagement, with enthusiasm negatively correlating with foreign language boredom and anxiety, and positively with foreign language enjoyment. Conversely, perceived teacher anxiety shows a positive correlation with foreign language anxiety and boredom, and a negative one with enjoyment. Achievement emotions, including enjoyment, boredom, and anxiety, are also found to be intricately linked to student engagement. Notably, foreign language enjoyment, boredom, and anxiety partially mediate the relationship between perceived teacher enthusiasm and student engagement.

These findings have several important pedagogical implications for English language teaching practices. Firstly, they underscore the pivotal role of teacher enthusiasm in fostering student engagement and creating a positive learning atmosphere. Teachers can enhance their enthusiasm and create engaging class activities to improve their own happiness and, consequently, infect more students to actively participate in class both behaviorally and emotionally. Teacher trainers should also recognize the importance of positive teacher emotions and help teachers develop skills to express humor, passion, and sympathy toward students. Despite the weak

correlations found between teacher negative emotions (anger and anxiety) and student engagement, it is crucial for teachers to manage and mitigate any appearance of negative emotions to ensure a conducive learning atmosphere.

Furthermore, the study highlights the significance of emotions in language learning, particularly the relationship between achievement emotions and student engagement. Teachers should be attentive to students' emotional experiences and provide support to address feelings of boredom and anxiety, while fostering a positive learning environment conducive to enjoyment and satisfaction. By understanding the mediation effect of foreign language enjoyment and boredom, teachers can utilize emotional contagion as an instructional strategy to improve students' emotional experiences in class and enhance their engagement.

The emotional pathway revealed in this study underscores the critical importance of teachers in cultivating a nurturing learning environment. Whether for human educators or AI systems, affective factors are vital in evaluating the efficacy of feedback. The research indicates that, when integrating AI feedback into conventional classroom frameworks, educators and curriculum developers should not disregard the emotional contributions of teachers and should be cognizant of the potential effects of AI systems on students' emotional health. Future instructional models could leverage human-AI collaborative feedback systems, where AI manages repetitive and technical aspects, while teachers offer personalized emotional guidance and motivation. This synergy offers a well-rounded strategy that merges the efficiency of AI with the compassion embedded in human interaction.

However, it is crucial to acknowledge several limitations in this study. Firstly, the reliance on questionnaires and self-report measures may have introduced social desirability bias and subjectivity, potentially distorting the results. Furthermore, the scales used were not specifically tailored to the unique characteristics of language teaching classrooms, which could hinder the interpretation of the findings. Additionally, the sample is confined to undergraduate English major students from four science and engineering universities, excluding perspectives from other demographics, proficiency levels, and comprehensive universities, thereby potentially limiting the applicability of the results. Furthermore, the gender imbalance among participants, with a predominantly female population, restricts the generalizability of the findings to male populations or more gender-balanced environments. To address these limitations, future studies could incorporate qualitative data (e.g., interviews) to bolster the reliability and validity of the findings, include participants from various educational backgrounds, proficiency levels, and diverse majors to enhance representativeness, and ensure balanced gender representation in the sample. Finally, future research should also delve into curriculum-specific achievement emotions and examine the influence of teacher emotions on students' achievement emotions and engagement.

Despite these limitations, this study contributes significantly to the fields of English teaching and SLA research. The findings provide valuable insights into the mechanisms through which teacher emotions impact student engagement and the transmission of enthusiasm in the classroom. They also underscore the importance of addressing students' emotional experiences in language learning and the potential use of emotional contagion as an instructional strategy to enhance student engagement. By addressing these limitations in future research, we can further

refine our understanding of the role of emotions in language teaching and learning and develop more effective instructional strategies to support students' academic and emotional wellbeing.

Data availability statement

The original contributions presented in this study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the China University of Petroleum-Beijing. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

HS: Conceptualization, Funding acquisition, Methodology, Project administration, Resources, Supervision, Validation, Writing – review & editing. RL: Investigation, Software, Visualization, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Generative AI was used in the creation of this manuscript.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1567477/full#supplementary-material>

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