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Impact of classroom activity types on academic emotions in second language learners: a study on enjoyment and boredom

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Abstract. This study explores how classroom activity types shape enjoyment and boredom among Chinese university students in foreign language learning over a four-week period, as well as the relationship between these emotions and academic achievement, based on Control-Value Theory. Using a mixed-methods approach, data was collected from 65 second-year students, measuring emotions through five-point Likert scale questionnaires after each class, gathering 846 questionnaires, each corresponding to a specific Classroom Activity Type (CAT), and supplemented by open-ended questionnaires. Academic achievement was assessed through pre-test and post-test evaluations at the beginning of the study and after 13 weeks. Results show a significant negative correlation between Foreign Language Enjoyment (FLE) and Foreign Language Boredom (FLB). Traditional activities such as practice exercises and teacher lectures were associated with lower FLE and higher FLB, while interactive activities such as teamwork, student presentations, and multimedia use were associated with higher FLE and lower FLB. Interestingly, these emotional experiences had no significant predictive value for academic achievement after 13 weeks, but students often perceived boring activities as useful, suggesting a potential disconnect between emotional experiences and perceived value. These findings emphasize the importance of designing engaging classroom activities to enhance enjoyment and alleviate boredom, providing valuable insights for educational practice and policy.

Keywords: foreign language enjoyment, foreign language boredom, classroom activity types, Control-Value Theory, academic achievement

1. Introduction

Emotions are the invisible architects of learning experiences, shaping how we engage with and retain new information. In the field of Second Language Acquisition (SLA), understanding learners' emotional landscape is crucial for optimizing educational outcomes. Krashen's Affective Filter Hypothesis [1] laid the foundation for recognizing the impact of emotions on language learning, indicating that affective variables can either facilitate or hinder the learning process. Building on this, positive psychology shifted focus toward leveraging positive emotions to enhance learning experiences, with Broaden-and-Build Theory [2] and Control-Value Theory (CVT) [3] providing insights into how positive emotions expand cognitive resources and how control/value appraisals shape academic emotions, respectively.

In language classrooms, Foreign Language Enjoyment (FLE) and Foreign Language Boredom (FLB) have received considerable attention [4-6]. FLE is characterized by feelings of happiness and satisfaction when learning a new language and is associated with higher motivation and performance [7]; whereas FLB manifests as disengagement and lack of interest [8], potentially damaging learning outcomes. Although previous research has explored the effects of FLE and FLB on immediate learning outcomes [8, 9], fewer studies have investigated their impact on long-term academic achievement. Additionally, the role of specific Classroom Activity Types (CATs) in inducing these emotions remains understudied. Understanding how different CATs influence FLE and FLB can provide valuable insights for educators seeking to design more effective and engaging language learning environments.

2. Literature review

2.1. Theoretical framework

Krashen's affective filter hypothesis [1] holds that emotions play a role in language learning and that an individual's emotions can help or hinder the learning of a new language. This belief has been widely accepted by academia and has since changed the landscape of SLA.

Interest in the study of emotions in language learning has strengthened with the introduction of Positive Psychology (PP) [10], whose goal is to help people thrive and flourish, in the field of SLA. One of the three issues that PP mainly addresses, that is, the study of positive emotions, has attracted the attention of many SLA researchers. In particular, they have shown interest in the effects of a wide range of positive emotions, such as passion, grit, and enthusiasm [11-13], rather than exclusively focusing on a limited number of negative emotions (i.e., anxiety). Recent research has further explored the application of positive psychology in L2 education, identifying key constructs such as foreign language enjoyment, well-being, resilience, emotional regulation, academic engagement, grit, and caring teaching, all of which are crucial for enhancing the L2 learning experience and outcomes [14].

In this environment, the broad-and-build theory [2, 15] was proposed. It describes how positive and negative emotions influence language learning differently. It posits that positive emotions facilitate the building of an individual's resources by broadening one's momentary thought–action repertoire, which helps facilitate language learning and consequently improves the odds of success, while negative emotions lead to the opposite functions. This claim is supported by recent empirical research [16-21]. The theory also holds that positive emotions can offset negative emotions, thereby inspiring researchers to determine whether or how these two types of emotions offset each other.

Contrary to the broad-and-build theory's binary taxonomy of emotions, the control-value theory (CVT) [3] approaches emotions from three dimensions: object focus (activity/process vs. outcome emotions), valence (positive vs. negative), and activation (activating vs. deactivating). It provides an integrative framework to depict the antecedents (environment, control/value appraisal), occurrence, and effects (learning achievement) of emotions and the reciprocal relation of the three. It is a powerful structure for the understanding and study of academic emotions. In this framework, while emotions can be affected by many antecedents (autonomy support, instruction, etc.), the proximal determinants are control and value appraisals, which respectively refer to learners' perceived control over the task (i.e., Is it too difficult?) and the value of the task (i.e., Is it worthwhile?). When the learner believes the task is controllable and valued positively, positive emotion is induced, and vice versa.

2.2. Foreign Language Enjoyment (FLE) and Foreign Language Boredom (FLB)

2.2.1. Relation between FLE and FLB

Among the academic emotions being studied so far, Foreign Language Enjoyment (FLE) and Foreign Language Classroom Anxiety (FLCA) are the most researched subjects. As one is a positive emotion and the other negative, they are frequently compared in different studies [4, 9, 22-24]. Influenced by the broad-and-build theory, which holds that negative emotions can be offset by positive emotions, researchers have tried to determine whether these two emotions share a negative correlation. However, pointed out that FLE and FLCA are not in a seesaw relationship, that is, combatting one does not guarantee the boost of the other [25]. This notion is in accordance with the finding of the most recent research of Li, who claimed that while no significant correlation exists between FLE and FLCA, a higher FLE is found to predict lower FLB [26]. The latter finding echoes that of another study [27].

2.2.2. Effects and Antecedents of FLE

Pekrun approached FLE with the frame of CVT, defining it as a positive activating and process-related emotion [8]. Csikszentmihalyi described it as an essential component of flow experience that encompasses the accomplishment of something challenging and surprising [28]. Such description was later complemented by Dewaele and MacIntyre [9], who described FLE as a feeling of being "happy and proud, gratified and satisfied" that occurs when "one has 'nailed' a difficult task."

FLE is found to have moderate to significant positive effects on motivation [29], class performance [4], engagement [30], and willingness to communicate [31, 32]; such influence is what the broad-and-build theory refers to as broadening one's momentary thought–action repertoire or meeting the antecedents to ignite positive emotions in terms of CVT. Therefore, under CVT and broad-and-build theory, FLE should lead to better academic achievement, as confirmed by several studies [4, 16, 29, 33-36].

When investigated 384 non-English major college freshmen's FLE in online English courses, they found that FLE has independent positive predictive effects on academic achievement [16]. Along the same line, Li and Wei reported the potential existence of a time limit on the connection between achievement emotions and subsequent academic achievement and explained that FLE remains the strongest and most enduring predictor of academic achievement [5]. The study investigated a group of junior secondary English learners (n = 954) in rural China and collected questionnaire and achievement data at four different time points

(a duration of nine weeks). Structural equation modeling results showed that FLE was a robust predictor for the learning outcomes across the four time points.

With FLE's obvious positive influence on classroom atmosphere and learning outcomes, researchers have tried to find its antecedents. Based on CVT, Putwain collected self-report data from 579 students in their final year of primary schooling over three waves [6]. Control and value appraisals were found to be significant predictors of FLE. Li attempted to identify contributors by examining learner and teacher variables [27]. The study investigated 868 university students and revealed that FLE was positively correlated with learner variables (self-perceived FL proficiency, relative standing among peers, attitudes toward FL, teachers, and FL-related culture) and teacher variables (the use of FL in class, enthusiasm, predictability, and friendliness). The findings of this research are echoed by other studies [12, 27] claiming that FLE is a robust and enduring predictor of learning outcomes.

2.2.3. Effects and Antecedents of FLB

FLB is a frequently experienced emotion in FL classrooms [30, 37]. Conceptualized from the three-dimensional taxonomy of achievement emotions [3], boredom is a negative, deactivating, and activity-related emotion. It is a ubiquitous unpleasant feeling, which features low physical or cognitive arousal, twisted time perceptions, and a desire to withdraw from boredom-inducing activities or situations [38].

FLB reduces learners' class performance; negatively affects the usage of cognitive resources, motivation, and engagement [17, 39, 40]; and ultimately exerts a lasting detrimental effect on learning outcomes [8, 20]. However, Li and Wei found that FLB fails to predict achievement after one week [5].

Zawodniak [41] attributed the sources of boredom to class activities that are over- or under-challenging, overloaded with information, lacking variety and originality, unrelated, and lacking autonomy. Their follow-up research added factors such as repetitiveness and unclear task purpose as antecedents of FLB [42]. They explained that when students are not aware of the purpose of a given task, they regard it as irrelevant and, thus, useless. They also found that among different class components, reading, writing, and listening tasks are regarded to be the most boring parts. Apart from the factors mentioned above, Pawlak contended that inactivity (when students finish an activity ahead of others, such as in the case of lengthy reading tasks), uninteresting subject matter, and lack of interaction could also trigger high levels of boredom [43]. These results are aligned with those of other studies [5,6,40,43-47].

Zawodniak showed that teachers' constant negative and unpleasantly conveyed comments and their lack of engagement [41], explicit instruction, feedback, and support relate to high levels of boredom. Researchers have also found that teachers' personalities, the repertoire of teaching tools [42], insufficient explanation, excessive lecture [47], and teachers' inappropriate decisions regarding choice and use of language materials [48] can also contribute to the arousal of boredom.

Li also examined how learner-internal and teacher-centered variables relate to the occurrence of Foreign Language Learning Boredom (FLLB) [27]. Their results revealed that FLLB was negatively linked to these two variables. Learners' variables include control appraisal (such as self-perceived FL proficiency and relative standing among peers), value appraisal (such as attitudes toward the FL and FL-related culture), and learners' attitudes toward the FL teacher. Meanwhile, teacher-centered variables encompass teachers' use of FL in class, enthusiasm, predictability, and friendliness.

3. The present study

The literature review shows that previous studies have mainly focused on the effects of FLE/FLB on academic achievement. While most of these studies have agreed on the effects of FLE/FLB on learning outcomes, recent research has suggested a possible time limit on the effects of these emotions, emphasizing that the FLB's effects on actual exam scores cannot be found after one week.

The antecedents of FLE or FLB are mainly attributed to value/control appraisals or learners'/teachers' variables. Some studies have explored how class activities contribute to the inducement of certain emotions. However, they tend to regard a class, rather than class activities, as the minimum unit, or they classify activities according to the language skills to be trained, such as writing, reading, and listening.

However, even when training for the same language skills, FL classes can consist of different CATs, including lectures, exercises, collaborative tasks, presentations, and use of multimedia tools. To apply the findings of previous research in pedagogical practice, one needs to know how CATs affect the level of emotions and subsequently be able to find measures to boost FLE and alleviate FLB to optimize class design. However, this aspect remains under-investigated.

In an attempt to fill these gaps, this study investigated the link between FLE/FLB and the five most common CATs, namely, "Practice and Drills" (P&D), "teacher's lecture" (TL), "Team Work" (TW), "Students' Presentation" (SP), and "Playing Multimedia" (PM). This study specifically answers the following research questions:

1. What is the relationship between a learner's Foreign Language Enjoyment (FLE) and Foreign Language Boredom (FLB)?
2. To what extent do FLE and FLB affect academic achievements after 13 weeks?
3. What is the relationship between Classroom Activity Types (CATs) and learners' FLE and FLB?
4. How do different CATs affect learners' FLE and FLB levels?

5. Which specific factors within CATs contribute to the inducement of FLE and FLB, and are there common factors across different CATs?

4. Methodology

4.1. Research context and participants

This study focused on FLE and FLB experienced by 65 Chinese second-year English major university students in an English course over a four-week period. A pretest and a posttest on academic achievements were respectively performed at the beginning of the research and 13 weeks after the last collection of other data. Quantitative data were collected from 65 students, which included 3 males and 62 females aged 19–20 years. Gender imbalance reflects the typical demographic characteristics where females dominate English majors in Chinese universities. Out of 65 students, 61 participated in the follow-up open-ended questionnaire survey, achieving a retention rate of 93.8%. The 4 non-participants have not completed it due to time conflicts.

The classes involved in the research were delivered by one English teacher, who had taught the participating student for one academic year. The teaching evaluation scores of this teacher, as rated by the 65 students, were among the top 10 scores in the college for the last two semesters, thereby suggesting the students' overall approvement of the teacher. At the time of the study, the teacher had been working for 20 years and had been teaching the English course for 6 years. She had also won several teaching competitions at various levels in the past five years, suggesting her fine teaching skills and sophisticated ability in class design. Selecting an experienced and highly-rated teacher aims to minimize variability in teaching quality, focusing instead on the impact of different types of CATs.

The English course involved in this research is called An Integrated English Course, which is defined by China's Educational Ministry as a compulsory and core course for English majors in China. The course has the highest credit and longest duration in the students' four-year study; hence, it is regarded by colleges and students as one of the most important courses in this stage, suggesting the comparatively strong (extrinsic) motivation of learners.

Hence, in this research, the quality of the class design, the teacher's variables, the learners' (extrinsic) motivation, and value appraisals are under a comparatively ideal condition.

4.2. Data collection

This research employs both quantitative and qualitative methods for data collection. The quantitative data was collected through five-point Likert scale questionnaires that assessed students' FLE and FLB levels over a four-week period. Each questionnaire contained two single-item questions: one evaluating FLE and one evaluating FLB, with ratings ranging from 1 (lowest) to 5 (highest). TThese questionnaires were administered through the Qunbaoshu application at the conclusion of English classes, each linked to a specific Classroom Activity Type (CAT). In total, 846 questionnaires were collected, encompassing five distinct CATs: Practice and Drills (P&D), Teacher's Lecture (TL), Team Work (TW), Students' Presentation (SP), and Playing Multimedia (PM). This experience sampling approach was designed to capture students' real-time emotions in response to different CATs.

Additionally, at the end of the four weeks, an open-ended questionnaire was distributed through the same application to collect detailed qualitative data. This questionnaire included six questions designed to explore students' perceptions of the most boring and most interesting parts of the class, the reasons behind these perceptions, and their perceived usefulness. The questions were as follows:

1. What was the most boring part of the class?
2. In your opinion, why did the part mentioned above make you feel bored?
3. Do you think the boring part mentioned above was useful to you?
4. What was the most interesting part of the class?
5. Why did you find it interesting?
6. Did you find it useful?

All questionnaires were provided in Chinese to ensure understanding and accurate responses.

Academic achievement was assessed through a pre-test at the beginning of the research and a post-test conducted 13 weeks after the completion of the four-week data collection period.

4.3. Data analysis

The data analysis began with the entry of all the data extracted from the aforementioned Likert scale questionnaires into SPSS 26. To answer RQ1–2, which examine the relationship between FLE, FLB, and learning achievement, Spearman correlation analyses were conducted. This choice was made due to the involvement of ordinal variables (FLE and FLB levels) and a continuous variable (learning achievement), calculated using the formula:

Learning achievement = (posttest−pretest)/pretest

To answer RQ3–4, which explore the impact of CATs on FLE and FLB levels, ordinal logistic regression analyses were performed: 1) CATs and FLE level were entered as predictor and outcome variables, respectively; 2) CATs and FLB level were entered as predictor and outcome variables, respectively.

For convenience of analysis, the five most common CATs in the English classes were classified as P&D, TL, TW, SP, and PM and were coded as CAT 1, 2, 3, 4, and 5, respectively.

In answering RQ5, an open-ended questionnaire was adopted to extract the required information. The answers to the written questionnaire produced a total of 7,160 Chinese characters. Content analysis was performed to analyze the qualitative data collected from the open-ended questionnaire. It involved a stepwise process comprising two broad stages [49, 50]:

1. The researcher went through all the qualitative data, highlighting any important content and key points in each student's response.
2. Based on the information highlighted in Step 1, broader categories were formed to describe the content of the response such that it could be compared with other responses.

5. Findings

5.1. Quantitative results

The results of the Spearman correlation analyses show that FLB and FLE levels have a significant negative correlation ($p = 0$) (Table 1). FLB is negatively correlated with the CATs while FLE is strongly positively correlated with the CATs ($p = 0.01$). The correlation between learning achievement and FLB/FLE is slim.

Table 1. Result of Spearman correlation analysis

Correlations						
			FLE	FLB	CAT	Learning achievement
Spearman's rho	FLE	Correlation Coefficient	1.000	-.698	.113	-.006
		Sig. (2-tailed)	.	.000	.001	.866
		N	846	846	845	845
	FLB	Correlation Coefficient	-.698	1.000	-.073	.058
		Sig. (2-tailed)	.000	.	.034	.092
		N	846	846	845	845
	CAT	Correlation Coefficient	.113	-.073	1.000	.047
		Sig. (2-tailed)	.001	.034	.	.174
		N	845	845	845	845
	Learning achievement	Correlation Coefficient	-.006	.058	.047	1.000
		Sig. (2-tailed)	.866	.092	.174	.
		N	845	845	845	845

Ordinal logistic regression analysis is performed to further explore the relationship between FLB, FLE, and CATs. CATs and FLE are used as the independent and dependent variables, respectively. The model fitting information shows $p = 0.01$, indicating that the model is valid. Pearson and deviance methods are used to analyze the model's goodness of fit, and their results suggest a good fit, with *p*-values of 0.469 and 0.504, respectively.

The results of the ordinal logistic regressions of FLE are displayed in Table 2. CATs predict FLE positively and significantly ($p < .001$), with P&D and TL predicting lower levels of FLE and with TW, SP, and PM predicting moderate to higher levels of FLE.

Table 2. Ordinal logistic regression analysis of FLE

Parameter Estimates								
		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[FLE = 1]	-1.920	.169	129.783	1	.000	-2.250	-1.590
	[FLE = 2]	-.800	.145	30.357	1	.000	-1.085	-.516

Table 2. Continued

	[FLE = 3]	.905	.146	38.607	1	.000	.619	1.190
	[FLE = 4]	2.329	.167	194.705	1	.000	2.002	2.656
Location	CAT	.163	.049	11.043	1	.001	.067	.259

When CATs and FLB are respectively used as the independent and dependent variables for the ordinal logistic regression analysis, model fitting information shows $p = 0.028$, indicating that the model is valid.

The results of the ordinal logistic regressions of FLB are displayed in Table 3. CATs negatively predict FLB ($p < 0.05$), with P&D and TL predicting higher levels of FLB and with TW, SP, and PM predicting moderate to lower levels of FLE.

Table 3. Ordinal logistic regression analysis of FLB

Parameter Estimates								
		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[FLB = 1]	.973	.186	27.261	1	.000	.608	1.338
	[FLB = 2]	2.300	.215	114.527	1	.000	1.879	2.721
	[FLB = 3]	3.584	.300	142.420	1	.000	2.995	4.172
	[FLB = 4]	4.421	.413	114.696	1	.000	3.612	5.231
Location	CAT	-.150	.069	4.699	1	.030	-.285	-.014

5.2. Qualitative findings

An open-ended questionnaire is adopted to collect the required information to answer RQ5.

5.2.1. Moments and perceived reasons of experiencing FLE

When asked about the moment of experiencing FLE, most of the students chose “multimedia/watching video” (n = 39) or “team work” (n = 29). A very limited number of students mentioned “teacher’s lecture” (n = 3), “listening to other students’ reports” (n = 2), “personally answering questions” (n = 2), and “engaging in a contest/gaming” (n = 2).

When asked the reasons for the arousal of enjoyment, “cooperation and communication” (n = 10) was the most frequently mentioned answer. This reason is mainly paired with FLE in TW. Student #58 said, “It allows communication within the team.” Student #20 said, “It’s a lot more fun to try to find out the answer for the question together!”

“The arousal of curiosity” (n = 9) was also frequently mentioned. Student #18 said, “Probably because my curiosity is aroused, and I really want to know the answer, and I enjoyed the process of finding it.” When other reasons are comparatively related to one or two CATs, the arousal of curiosity can be paired with four CATs in this research, with the exception of P&D.

Some students were especially excited about the chance of having autonomy in learning (n = 8). This reason is mainly paired with TW. Some were especially happy upon learning something new (n = 8), which mainly pairs with TL and PM.

When asked to evaluate the value of the scenario in question, except for one student answering “a bit” and one not responding, the rest of the students claimed that “it’s useful.” The results are presented in Figure 1.

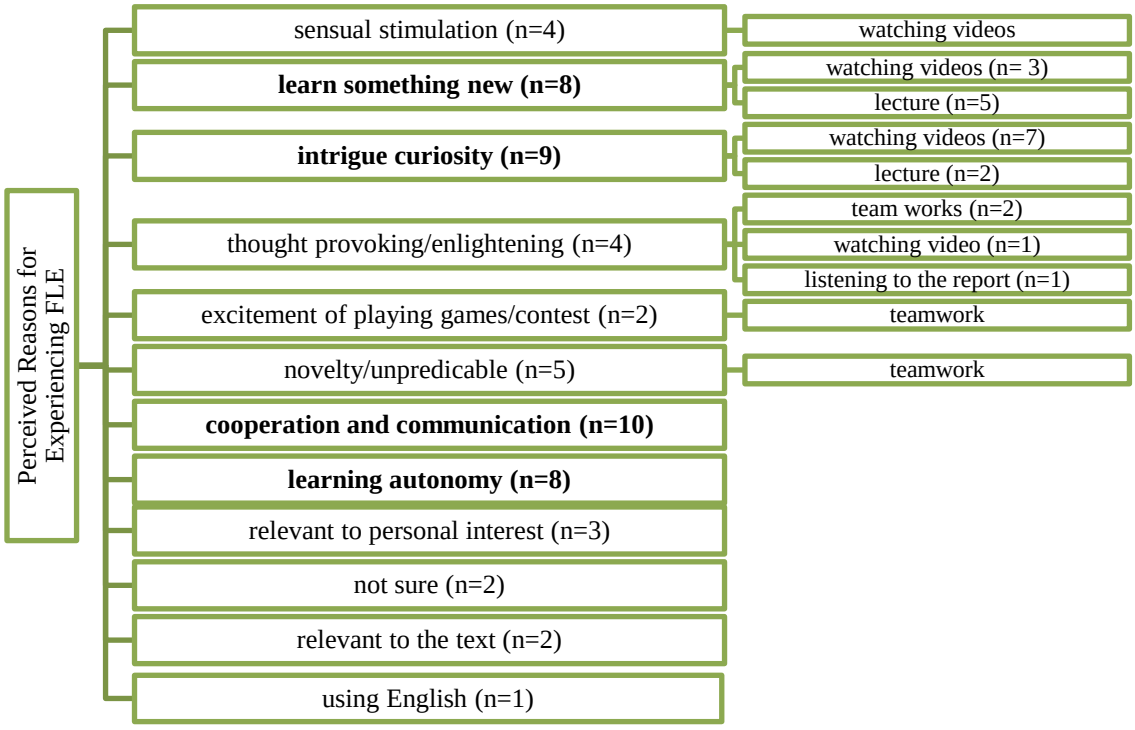

Figure 1. Perceived reasons of experiencing FLE

5.2.2. Moments and perceived reasons of experiencing FLB

The analysis of qualitative data suggests that "teacher's lecture" (number of times mentioned: n = 15 times) and "listening to other students' reports" (n = 19) are the most likely moments to induce FLB. Meanwhile, some students could not remember the scenario of being bored (n = 13). The results are shown in Figure 2.

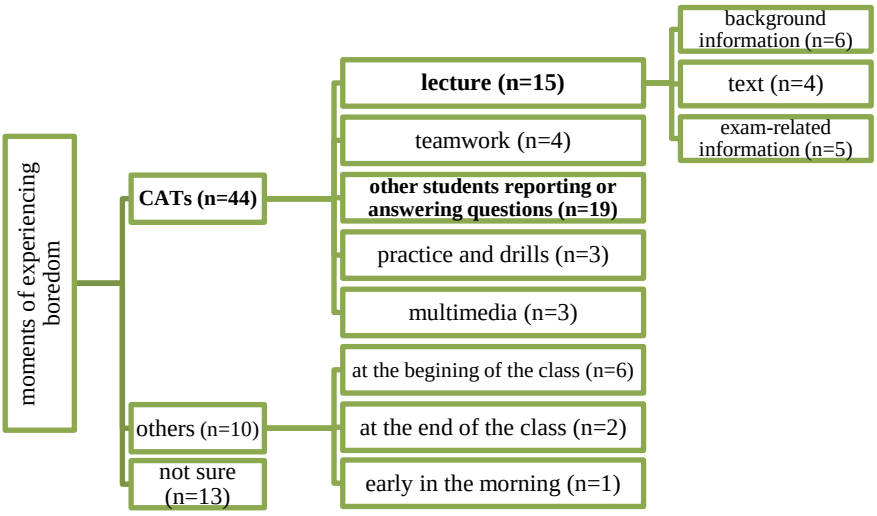

Figure 2. Moments of experiencing FLB

For the question "What makes you feel bored in the section mentioned in the previous question?", the most frequent answers were "repetition" (n = 16), "not interested" (n = 10), and "overchallenging" (n = 10). The repetition of similar content caused them to lose interest. It would often happen when other students were answering questions or giving reports. The respondents complained about the lack of original opinions in other students' answers. Some students (n = 10) found difficulties in paying attention to the content, saying that they were simply not interested in this topic ("It's just not my thing"). Students (n = 10) are very likely to give up on any attempt to follow the class if they think the task at hand is too difficult ("The exercise is so difficult,

I can't do it."; "I always do badly in grammar; they are so confusing. I don't think I can ever handle it.") and will consequently feel bored.

Some students (n = 5) thought that if one CAT lasted too long, they were likely to experience FLB (Figure 3). Difficulty following the flow of the class can also induce FLB (n = 7). It can be the result of the inability to receive information properly owing to speakers' inappropriate volume or poor font design on a slide; it can also be the result of reluctance to interact and participate in teamwork when they are not familiar with their teammates. Surprisingly, frustration can also induce FLB. Two students mentioned that they gave up on following the class when they found out that they did badly in a prior practice.

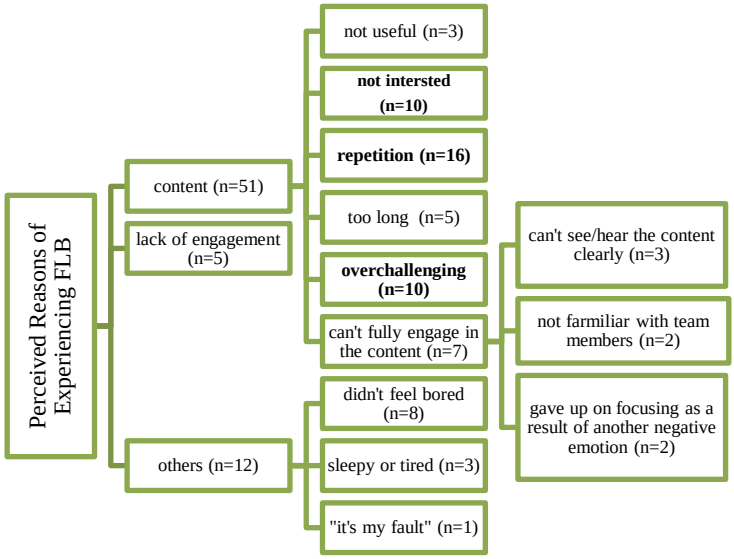

Figure 3. Perceived reasons of experiencing FLB

Although the students' reasons for the arousal of FLB varied, when asked how to evaluate the value of the section that caused boredom, most of the students (n = 44) claimed that "it's useful," with only three students bluntly saying that "it's useless" and with six of them not responding to the question.

6. Discussion

6.1. Relationship between FLE, FLB, and academic achievement

The first two research questions (RQ1-2) explored how FLE and FLB relate to each other and their long-term impact on academic achievement over 13 weeks. Our findings showed a strong negative correlation between FLE and FLB, aligning with previous studies [25, 27]. This suggests that when students enjoy language learning, they are less likely to feel bored, supporting the CVT, which indicates positive and negative emotions often counteract each other in educational settings [3].

However, after 13 weeks, neither FLE nor FLB significantly predicted academic achievement, which differs from some earlier research reporting notable effects [33, 34]. This discrepancy may arise from methodological variations; our study used a pre-test/post-test design with Spearman correlation, while Li and Wei employed structural equation modeling with multiple time points [5], potentially capturing more complex dynamics. Participant differences also matter: Li studied rural junior secondary students, whereas our focus was on urban college English majors, possibly affecting how emotions influence outcomes due to age, motivation, or educational context [5]. Future studies should explore how factors like age or socioeconomic background might moderate these relationships.

6.2. Impact of classroom activity types on FLE and FLB

Research questions 3 to 5 (RQ3-5) examined how CATs influence FLE and FLB, and what specific factors within these activities trigger these emotions. Both quantitative and qualitative analyses confirmed a clear link between CATs and student emotions. Traditional activities like "Practice and Drills" (P&D) and "Teacher's Lecture" (TL) were linked to lower FLE and higher FLB, while interactive activities such as "Team Work" (TW), "Students' Presentation" (SP), and "playing multimedia" (PM) were associated with higher FLE and lower FLB. This supports student-centered learning theories, which suggest active engagement fosters positive emotions [51].

Qualitative insights revealed that different CATs affect emotions in unique ways. For example, repetition and overly challenging tasks were key inducers of FLB, especially in TL and P&D, consistent with prior research on boredom in language

learning [6]. Conversely, curiosity was crucial for boosting FLE across multiple CATs, emphasizing its role in enhancing positive experiences. Other FLE factors included cooperation and communication, particularly in TW, and learning autonomy, aligning with CVT's focus on perceived control and value [3, 27]. Specific triggers included lengthy or uninteresting activities causing higher FLB in TL and P&D, and poor presentation quality inducing FLB in SP. Meanwhile, game-like competition in TW, theme relevance in PM, and thought-provoking content in PM boosted FLE. These findings highlight the need for educators to design engaging, appropriately challenging, and relevant activities to optimize emotional experiences and learning outcomes.

7. Implications, limitations, and suggestions for future research

7.1. Implications for L2 teaching and research

This study's results provide several implications for Second Language (L2) teachers, researchers, and educational policy makers. First, the significant negative correlation between FLE and FLB aligns with CVT, which suggests that positive and negative emotions often counterbalance each other in educational settings [3]. This indicates that interventions reducing FLB (such as decreasing repetitive tasks and increasing interaction) may simultaneously enhance FLE, creating a more positive learning environment. Teachers can achieve this by designing diverse teaching methods, incorporating student interests, and providing appropriate challenges.

Second, contrary to some previous research, this study found minimal impact of FLE and FLB on academic achievement after 13 weeks. This may relate to methodological differences; this study employed a pre-test/post-test design with Spearman correlation analysis, while other studies might use longitudinal structural equation modeling or shorter timeframes [5]. Participant backgrounds may also play a role: this study focused on urban university English majors, while other studies involved rural middle school students, suggesting that age, educational level, and economic background may moderate the impact of emotions on achievement. Future research should explore these contextual factors to better understand the long-term effects of emotions on language learning outcomes.

Third, the research identified curiosity as a powerful driver of FLE, especially in interactive CATs such as team work, student presentations, and playing multimedia. Curiosity not only enhances engagement but also promotes deeper learning and retention [52]. Teachers can stimulate student curiosity by designing inquiry-based tasks, problem-solving activities, and introducing novel content, providing specific guidance for curriculum design.

Fourth, interactive CATs (such as TW, SP, PM) are associated with higher FLE and lower FLB, while traditional activities like Practice & Drill (P&D) and Teacher Lectures (TL) are associated with lower FLE and higher FLB. This supports student-centered learning theories that emphasize the importance of active participation and interaction [51]. Educators should prioritize integrating collaborative and multimedia activities to optimize language learning experiences. Additionally, although students may find certain necessary activities (such as TL and P&D) boring, most still consider these activities useful, suggesting teachers need to clearly communicate the purpose and benefits of activities to balance emotional engagement with educational value.

7.2. Limitations and suggestions for future research

Despite providing valuable insights, this study has several limitations. First, the sample size was relatively small (65 students) with an unbalanced gender distribution (62 female, 3 male), potentially limiting the generalizability of results. Future research should seek larger, more balanced samples to improve external validity. Second, the study is specific to the context of Chinese urban university English majors and may not apply to other cultural or educational backgrounds, suggesting cross-cultural comparisons to explore the influence of cultural factors.

Third, FLE and FLB were measured using single-item scales, which may lack the reliability and validity of multi-item scales; future research could adopt more comprehensive measurement tools. Fourth, the assessment of academic achievement relied only on one pre-test and post-test, potentially failing to capture the full range of learning outcomes; longitudinal designs and multiple assessment methods are recommended. Fifth, the study involved only one teacher, potentially not controlling for variations in teaching style or quality; future research should include multiple teachers to reduce this confounding effect.

Sixth, the classification of CATs into five categories and treating them as ordinal variables in regression analysis may simplify the complexity of classroom activities; future research could explore more CAT types or use categorical variable analysis. To extend current findings, recommendations include:

1. Adopting longitudinal designs to track the dynamic relationship between emotions and achievement;
2. Exploring the role of other positive emotions (such as hope, pride) in language learning;
3. Studying how individual differences (such as personality traits, learning styles) influence the impact of CATs on emotions;
4. Designing intervention studies to test the effects of optimizing CATs;
5. Investigating the role of technology in enhancing FLE, such as intelligent platforms providing differentiated support.

In conclusion, this study deepens our understanding of how classroom activities affect student emotions in language learning, emphasizing the importance of designing engaging and interactive learning experiences. By addressing the identified limitations

and pursuing suggested research directions, scholars can further elucidate the complex interactions between emotions, classroom practices, and academic outcomes.

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