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THE STUDENT ENGAGEMENT OF BLENDED LEARNING IN PRONUNCIATION COURSE IN EFL CONTEXT

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Abstract

This study investigates student engagement in a blended learning (BL) pronunciation course in an English as a Foreign Language (EFL) context. Drawing on the framework by Bowyer and Chambers (2017), the research examines three engagement dimensions—cognitive, behavioral, and emotional—among 228 freshmen at Hunan University of Humanities, Science and Technology. Data were collected through a validated questionnaire and analyzed using descriptive statistics. The findings reveal high engagement levels across all dimensions, with behavioral engagement (M = 4.06) scoring highest, followed by emotional (M = 3.92) and cognitive (M = 3.86) engagement. However, greater variance in emotional engagement suggests notable individual differences. These results indicate that BL effectively enhances engagement in pronunciation learning, but targeted support is needed for students with lower emotional engagement. The study underscores the value of integrating online and offline modes to foster active participation, deep cognitive processing, and positive affective experiences in EFL pronunciation instruction.

Keywords: English Foreign Learning, Blended Learning, English Pronunciation, Quantitative Research

1. INTRODUCTION

Teaching English as a Foreign Language (EFL) pronunciation is critical in the improvement of learners' communicative competence and oral language proficiency (Kabir et al., 2022). Pronunciation goes beyond accurately producing the right sounds. It also directly impacts the comprehensibility of language output, even if learners possess a rich vocabulary and grammatical knowledge, serious pronunciation problems can severely impact the effectiveness of communication (Tanner & Henrichsen, 2022). Furthermore, pronunciation is often considered a key indicator of a speaker's overall language proficiency, and fluent and authentic pronunciation significantly improves listeners' perceptions of their language proficiency (Neon, 2024). Due to the significance of English pronunciation, different pronunciation instructions have been applied to improve the teaching effects of the English pronunciation course in China.

First of all, conventional pronunciation class lay a solid foundation for students' theoretical understanding but does not allot sufficient time to develop the students' pronunciation competence for intercultural communication (Qader et al., 2024). To be specific, traditional pronunciation classrooms are teacher-centered, whereby the lecturer delivers information and displays slides at the front of the lecture room and students are mere passive recipients of information being delivered (Dogani, 2023). This form of instruction does not allot students sufficient time to practice applying their speaking skills, leading to limited interaction and engagement from students and thus does not add to students' competence to apply them effectively in communicative situations (Qader et al., 2024)

With evolving educational concepts and technological advancements, a growing number of new teaching models are being introduced into pronunciation instruction, including multimedia-based imitation training, instant feedback provided by speech analysis software, and the recent rise of hybrid teaching methods (Chun & Jiang, 2022). These innovative approaches aim to transcend the limitations of traditional teaching methods, creating richer learning scenarios and more precise guidance and feedback to comprehensively enhance the effectiveness of pronunciation instruction (Chun & Jiang, 2022).

Notably, blended learning (BL) is extensively applied in pronunciation classes in China to improve pronunciation teaching to address the challenges in the traditional classroom. By the BL method, the students spend more time practicing in pronunciation as they can learn the basic skills online before the class. Additionally, the BL method combines the online and offline classes and offers a new approach to improve the outcomes of the pronunciation class (Li, 2022).

It's worth noting that innovations in teaching models don't necessarily lead to improved learning outcomes. Previous studies have shown that students in blended learning environments are prone to cognitive overload and emotional disengagement. This is especially true in phonetics courses, which require extensive hands-on practice. Students can become frustrated by the lack of immediate guidance. Therefore, simply examining academic performance is insufficient to fully assess the effectiveness of blended pronunciation instruction. It's crucial to delve deeper into student engagement to get a fuller picture of the BL pronunciation course effectiveness.

Student engagement, involving cognitive, behavioral and emotional engagement, is an important indicator of the students' learning involvement in the learning process (Farida et al., 2024). It is an integral element for the students' academic achievement and positive learning outcomes (Bayoumy & Alsayed, 2021). However, the student engagement of BL in pronunciation courses remain under explored.

Based on the notions above, the study probe into the student engagement of BL in pronunciation class to gain a deep insight into the impact of the BL method on the student engagement of the pronunciation course in China.

2. LITERATURE REVIEW

2.1 Theoretical framework

The study adopted the new framework by Jessica Bowyer & Lucy Chambers (2017) to assess the student engagement of BL in pronunciation course in EFL context. The framework includes four dimensions to evaluate the impact of BL, namely: situation, course, individual, outcomes. The research focused on the student engagement of BL, which is one of the subdimensions of outcomes. Based on the framework, the student engagement includes cognitive engagement, behavioral engagement and emotional engagement (Jessica & Lucy, 2017). Cognitive engagement refers to the active use of thinking skills that require effort. It is often associated with learning activities which involve learning new things (Anderson et al., 2024). Behavioral engagement is the participation and involvement of students in academic activities (Hu et al., 2021). Emotional engagement refers to the emotional states experienced by participants in the learning process (Martucci et al., 2025).

2.2 The Student Engagement of English Pronunciation Course around world and in China

The literature has unveiled that student engagement in English pronunciation courses has obtained significant attention. Studies has demonstrated varying instructional approaches to pronunciation courses and corresponding engagement levels.

Initially，the traditional pronunciation courses adopted teacher-led oral-aural drills in the class. The courses were characterized by limited corrective feedback and student engagement (Xue & Dunham, 2021). In addition, technology tools such as mobile apps, speech visualization increased accessible practice and provided immediate multimodal feedback, resulting in higher cognitive, behavioral and emotional engagement in the pronunciation tasks (Yang, 2022). Besides, blended teaching implemented in Chinese higher education show measurable pronunciation improvements and increased opportunity for in-class interactive practice (Xue & Dunham, 2021). However, the student engagement of the BL courses is underexplored.

2.3 The Student Engagement of BL Practice in Higher Education courses around the World and in China

The literature has unveiled that blended learning positively impacts student engagement. Sandjaja (2025) found that the implementation of blended learning could create a more flexible and easily accessible learning experience, positively impact their learning engagement. Cai (2024) discovered that blended learning significantly enhances student engagement and learning outcomes, particularly in reading comprehension, vocabulary acquisition, and listening proficiency. However, Saad et al. (2021) discovered that undergraduate nursing students' academic engagement showed no differences in the BL class and the traditional class, implying BL did not impact student engagement in the nursing course. Based on the notions above, despite BL promote the student engagement in most course, the impact of BL on the student engagement is to be explored across different contexts (Cao, 2023).

In the China setting, Tang & Ling (2023) discovered that BL enhanced student engagement and improves English pronunciation in China. Moreover, BL took advantage of the online and offline learning, improving student engagement (Yang, 2020). However, Amrate &Tsai (2024) pointed out that BL could combine computer-assisted adaptive training in pronunciation courses, however, the engagement in pronunciation practice was characterized by repetitive activities such as listen-and-repeat, which limited interactive engagement. From the literature, the researchers assessed student engagement in the BL pronunciation courses as a whole, however, the impact of BL on the subdimensions of the student engagement in the pronunciation courses is still underexplored. Further study is needed to investigate a fuller picture of the student engagement of BL.

Based on the discussion above, the study aims to investigate the student engagement of BL in pronunciation course in EFL context to gain an insight into the impact of blended learning on the student engagement in English pronunciation course in EFL context.

3. Research objectives

Based on the discussions in the previous sections, the overall research objective of the research is to identify the student engagement of BL EFL pronunciation course, comprising three sub-objectives: Research objective

1(RO1): to assess the EFL student's cognitive engagement level of pronunciation course in BL setting

- Research objective 2 (RO2): to examine EFL student's behavioral engagement level of pronunciation course in BL setting
- Research objective 3 (RO3): to gauge the emotional engagement of BL of pronunciation course in BL setting

The conceptual framework of the study is as follows (Figure 1):

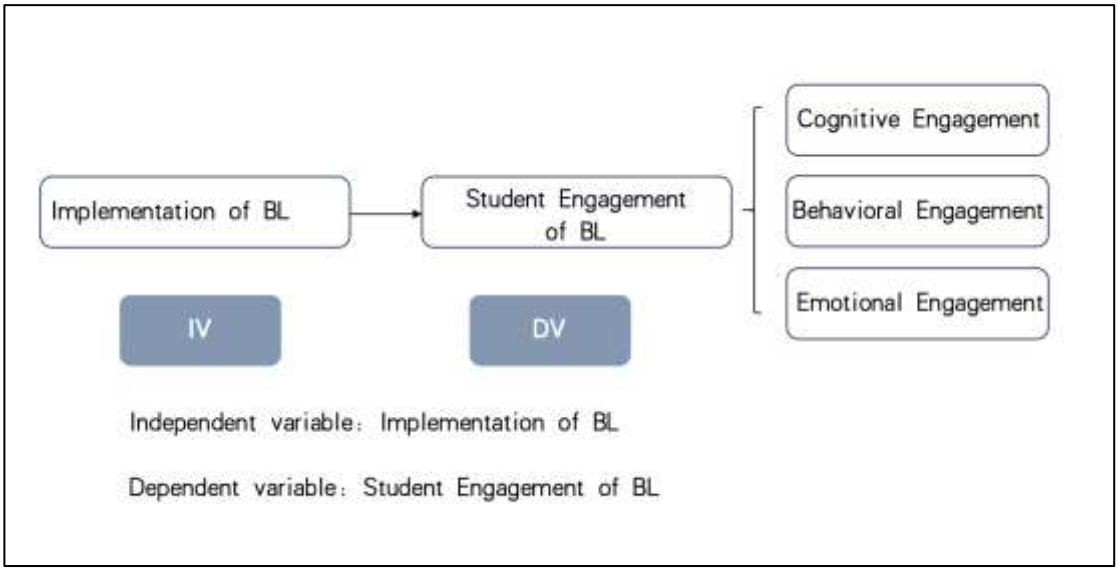

Figure 1 Conceptual Framework of the Study

This study proposes the following three hypotheses:

H1: The students' cognitive engagement level of pronunciation course in BL setting is high.

H2: The students' behavioral engagement of pronunciation course in BL setting is high.

H3: The students' emotional engagement of pronunciation course in BL setting is high.

These hypotheses will be tested using quantitative data.

4. METHODOLOGY

4.1 Sampling and Data Collection

The study adopted purposive sampling to delve deeper into students' experiences of engagement within a specific educational context. Specifically, we selected freshmen enrolled in a blended English pronunciation course at HUHST (Hunan University of Humanities, Science and Technology). This particular group was chosen based on two key considerations: First, as freshmen, they are at a critical stage in transitioning from traditional passive learning to a more self-directed learning model within higher education, making their learning behaviors and engagement patterns uniquely valuable for research. Second, their course, structured as a blended learning model, provided an ideal setting for examining students' cognitive, behavioral, and emotional engagement within a clearly defined context. Over the course of the semester, we extended invitations to all students in the course, ultimately recruiting 228 volunteers, forming the active sample for this study. Data collection was primarily conducted using validated quantitative scales specifically designed to measure multiple dimensions of engagement within blended learning environments. To ensure valid data interpretation, we administered the scale at the end of the semester, aiming to capture the relatively stable state of student engagement after students had adjusted to the hybrid learning model, rather than the initial novelty of the experience. While purposive sampling effectively captures in-depth data that is rich in information about the target population, it must be acknowledged that this approach also limits the generalizability of the findings to other student groups (such as older students), other subject areas, or diverse cultural contexts. Therefore, the primary purpose of this study was not to draw broad statistical inferences, but rather to conduct an in-depth, contextualized descriptive analysis of student engagement within a

specific educational intervention, providing a solid empirical foundation for subsequent research.

4.2 Measurement

This study used established scales with proven reliability and validity in previous research to ensure the reliability and validity of the collected data. All scales were scored using the internationally accepted five-point Likert scale, ranging from "strongly disagree" to "strongly agree," allowing students to clearly express the varying levels of their learning experience.

Student engagement was primarily measured using the Learning Engagement Questionnaire developed by Teng and Wang (2021). This scale consists of 24 items, evenly distributed across three dimensions: cognitive engagement, behavioral engagement, and emotional engagement, with eight items in each dimension. The cognitive engagement dimension primarily measures students' use of deep thinking strategies and metacognitive regulation during learning (Cronbach's $\alpha = 0.960$); the behavioral engagement dimension focuses on assessing students' effort, focus, and persistence in learning activities (Cronbach's $\alpha = 0.939$); and the emotional engagement dimension examines students' interest and emotional connection with learning (Cronbach's $\alpha = 0.939$). The internal consistency coefficients of all dimensions are much higher than the acceptable standard of 0.9, indicating that the scale has extremely high measurement reliability in the context of this study and can stably and accurately capture students' multidimensional participation status in a blended learning environment.

4.3 Data Analysis Process

This study adopted a quantitative analysis method and used SPSS 26.0 statistical software for data processing. The analysis process followed the following standardized process: (1) Data cleaning and preparation: First, the questionnaires collected were tested for completeness to ensure that there were no missing values; then, outliers were detected through box plots to confirm that all data were within a reasonable range. (2) Reliability test: Cronbach's α coefficient was used to test the internal consistency of the scale. The results showed that the α values of the three dimensions were all higher than 0.90, indicating that the measurement tool was reliable. (3) Descriptive statistical analysis: The mean, standard deviation, skewness and kurtosis of the three participation dimensions of cognition, behavior and emotion were calculated to fully describe the central tendency, dispersion and distribution of the data.

5 RESULTS

This study systematically quantitatively analyzed the collected valid data, focusing on three core research objectives. All data processing and analysis were completed using SPSS statistical software (version 26). The analysis mainly included descriptive statistics analysis. The goal was to comprehensively explore student engagement levels in terms of the cognitive, behavioral, and emotional dimensions in blended learning, thereby ensuring the scientific and reliable nature of the research conclusions.

5.1 Results of RO1

The following section introduces the results and findings of the quantitative data on the EFL student's cognitive level in the BL pronunciation course.

In Table 1, in the BL environment concerning Cognitive Engagement (CE), the mean score was 3.86 with a standard deviation of 0.39 and scores ranging from a minimum of 3 to a maximum of 4.75. The data showed that the cognitive engagement of the students was above average, H1 was supported. The cognitive engagement levels among students are relatively close, individual differences are small.

Table 1 Descriptive Analysis - The Cognitive Engagement Dimension

Teaching method	Varaible	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
	CE	228	3	4.75	3.86	0.39	0.172	-0.121

5.2 Results of RO2

As illustrated in Table 2, in the blended learning environment, the Behavioral Engagement (BE) had a mean score of 4.06 with a standard deviation of 0.66 and scores ranging from a minimum of 3 to a maximum of 5. This relatively high mean value indicated that students as a whole showed a positive level of behavioral engagement in the blended learning environment, H2 was supported. Specifically, student scores ranged from 3 to 5 points, with the lowest score of 3 indicating that all students achieved a moderate or above level of participation, while some students achieved a full score of 5, demonstrating a high level of learning engagement. The standard deviation was 0.66, reflecting moderate differences in behavioral engagement among individual students. The skewness was 0.324, showing a slightly positively skewed distribution, indicating that the data distribution was slightly tilted to the left, that is, the behavioral engagement scores of most students were concentrated in a range slightly below the mean.

Table 2 Descriptive Analysis - The Behavioral Engagement Dimension

Teaching method	Varaible	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Blended Learning	BE	228	3	5	4.06	0.66	0.324	-1.368

5.3 Results of RO3

As illustrated in Table 3, in the blended learning environment, Emotional engagement (EE) had a mean score of 3.92, with a standard deviation of 0.71, and a minimum score of 2.25, and a maximum of 5. This indicates that students generally have a high level of emotional engagement in the BL course, H3 was supported. However, the standard deviation is 0.71, the largest of the three engagement dimensions, indicating that there are significant differences in students' emotional responses. The highest score of 5 shows that some students are enthusiastic, but the lowest score of 2.25 confirms that a small number of students are obviously alienated or negative. The skewness is -0.409, which is a negatively skewed distribution, indicating that the data distribution is asymmetric and extends to the low score end. This means that the emotional engagement of most students is above average, but it also highlights the key minority group that must be paid attention to.

Table 3 Descriptive Analysis- The Emotional Engagement Dimension

Teaching method	Varaible	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Blended Learning	EE	228	2.25	5	3.92	0.71	-0.409	-0.016

6. DISCUSSIONS

The section discusses the student engagement of the English pronunciation course in the BL setting regarding three dimensions: cognitive engagement, behavioral engagement and emotional engagement. By analyzing the descriptive statistics for each dimension, we systematically reveal the students' level of cognitive strategy utilization, their level of learning behavioral engagement, and their positive emotional experiences within the blended learning model, thus presenting a comprehensive picture of the overall landscape and inherent characteristics of student engagement in this BL pronunciation course.

6.1 The EFL student's cognitive engagement level of English pronunciation course in BL setting

The average cognitive engagement score was 3.86. This data clearly indicates that the students maintained an above-average, teetering on the high side of cognitive engagement in the BL environment. Students were generally able to actively process their thoughts, develop deep understanding, and construct knowledge. Furthermore, the data had a small standard deviation of 0.39, reflecting relatively similar levels of cognitive engagement across

students and minimal individual differences, indicating that this teaching model has a relatively consistent positive effect in promoting students' cognitive development. In terms of distribution, the skewness value was 0.172, close to zero, indicating a generally symmetrical data distribution.

The previous studies have investigated the students' cognitive engagement under the VR environment which was 3.854 (Xin, 2022). However, the existing research did not provide specific data on the descriptive data of CE. Despite another research found the cognitive engagement of nursing undergraduates in blended learning curricula was at a moderate level, however, the data was drawn from a qualitative analysis (Xu et al., 2023). The results of this study were not consistent with Xu's research, with the cognitive engagement in BL class is generally above the average. Thus, this study provided further empirical evidence that the student engagement is generally moderately high with a mean score of 3.86 in the BL pronunciation course. Moreover, the present study proved that the cognitive engagement level in the BL class is moderately high.

Notably, the cognitive engagement level is generally high, nonetheless, students' cognitive engagement in BL varies given that empirical statistics demonstrate the lowest score is merely 3 while the highest score can research 4.75, which means there is a potential moderating factor that impacts the students' cognitive engagement.

6.2 The EFL student's behavioral engagement level of English pronunciation course in BL setting The average behavioral engagement score was 4.06. This data clearly indicates that the students maintained a high behavioral engagement level in the BL environment. It shows that the BL teaching design and implementation can effectively drive students' external learning behavior. The students participated the BL class actively. The standard deviation is 0.66. This value is significantly larger than the standard deviation of cognitive engagement (0.39) reported previously. This suggests that individual differences in behavioral engagement are more pronounced than in cognitive engagement. Some students are very active in their behaviors, while others are relatively less so, even though their average level is generally high. This resulted from the fact that the external behavior is more easily influenced by individual factors such as study habits, self-discipline, and time management. Consistent with the previous studies of Savandha et al. (2025), who pointed out blended learning effectively promotes students' behavioral participation in English language instruction. However, Ahmed (2025) declared that challenges such as technological barriers and gaps in digital literacy can hinder the BL's effectiveness in promoting behavioral engagement. The present study provided further empirical evidence that the behavioral engagement in the BL environment is at a high level with an average of 4.06. however, the standard deviation of behavioral engagement is large (0.66), indicating that there are significant differences in students' behavioral engagement in blended class. This phenomenon also suggests that behavioral engagement in blended learning is affected by other factors such as technological barriers and gaps in digital literacy, mentioned by prior research.

Comparing this table (BE) with the previous analysis (CE), we discover an interesting phenomenon: the mean score for behavioral engagement (BE) (4.06) is higher than the mean score for cognitive engagement (CE) (3.86), but the consistency of behavioral engagement (standard deviation 0.66) is much lower than that of cognitive engagement (standard deviation 0.39). This suggests that students' "acting" (BE) and the depth of their "thinking" (CE) are not consistent. Students may all complete the assigned learning tasks well (high BE), but the depth and level of their thinking may be much closer (low standard deviation of CE). This reveals the complexity of blended learning outcomes.

This finding warns against superficial engagement: high behavioral engagement (students appearing busy) does not automatically equate to high and consistent cognitive engagement (students engaging in deep thinking). The novelty of this study lies in its data suggesting the possibility of superficial compliance—students completing all required behavioral tasks but exhibiting varying levels of underlying cognitive engagement. Teaching assessment needs to move beyond behavioral indicators and delve deeper into the cognitive dimension.

6.3 The EFL student's emotional engagement level of English pronunciation course in BL setting

This result revealed that in a blended learning environment, students' emotional engagement presents a distribution

characteristic of "high level, obvious differences, and negative skewness." The mean score of emotional engagement was 3.92 (on a 5-point scale). This indicates that, overall, students experienced positive emotions in the blended learning course, such as feeling interested, enjoying, happy, or finding the learning valuable. This level is comparable higher to cognitive engagement (3.86) and slightly lower than behavioral engagement (4.06). The standard deviation was 0.71, the largest of the three dimensions (CE: 0.39, BE: 0.66). This indicates that students' emotional responses were the most diverse. Some students strongly enjoyed the model, while others experienced it more negatively. Although this result is expected given the highly subjective nature of emotions, it also highlights the challenge of meeting the emotional needs of all students. The Skewness was -0.409. This is a negatively skewed distribution. A negative skewness indicates a long left tail, meaning that most students scored above the mean, but a small number of students exhibited low emotional engagement, creating a long tail. This is a very positive sign, indicating that most students are concentrated in the high-scoring area.

Former studies verified the emotional engagement of the BL classes. The general finding of existing research claimed that blended learning can lead to generally positive emotional outcomes (such as learning interest and satisfaction) (Zhang &Jiang, 2024). Furthermore, the finding that emotional engagement generally exhibits significant individual variation is consistent with much research (Li & Ye, 2025). However, this study provides a more nuanced and optimistic picture, with its clear negatively skewed distribution. It suggests that the challenge of emotional engagement in blended learning may not lie in "most students being indifferent" but rather in "how to care for the minority of students who experience poor emotional engagement." This contrasts with some studies that report a normal or positively skewed distribution of emotional engagement in the synchronous delivery classroom (Qi et al., 2024).

The present study provided further empirical evidence of high emotional engagement in the BL pronunciation class. Furthermore, the negatively skewed distribution of emotional engagement is a valuable finding. It clearly indicates that the focus of teaching optimization should not be on broadly improving the emotions of all students, but rather on precisely identifying and supporting the "critical minority" of students whose emotional engagement scores fall below 3 (the mid-range level on the scale). This makes teaching interventions more targeted and effective.

7. CONCLUSION

Based on the findings mentioned, this study revealed the student engagement are high in the BL pronunciation class. This study, through a detailed descriptive statistical analysis of student engagement in a blended learning environment: behavioral, cognitive, and affective, revealed a picture that is both encouraging and thought-provoking. The study showed that while this blended learning model was highly successful overall, its success exhibited an asymmetric distribution across these three dimensions, providing a precise roadmap for future instructional optimization.

Initially, the cognitive engagement of the BL pronunciation class is moderately high. The cognitive engagement data (mean 3.86, standard deviation 0.39) are the most striking finding in this study. Not only do they demonstrate a high level of deep thinking among students overall, but their extremely low standard deviation and near-perfect distribution also demonstrate the tremendous success of the teaching intervention. This demonstrates that the blended learning model can, in a highly effective and inclusive manner, elevate and stabilize the thinking activities of nearly all students within a narrow, high-level range. It successfully narrows the "cognitive gap" that can arise from individual differences in innate abilities, creating a platform for high-quality and balanced cognitive engagement. The excellent performance of cognitive engagement in this study demonstrates the existence of a robust scaffolding system. A key future task is to refine and scale up this successful experience. Elements of this model, such as clear task paths, embedded thinking exercises, layered learning resources, and effective collaborative learning structures, should be summarized into replicable instructional design principles. Another

significant point is that the future BL class should ensure that all learning activities ultimately aim for deep cognitive processing, such as analysis, evaluation, and creativity, and use this as a core criterion for evaluating course quality.

Behavioral engagement achieved the highest mean value of the three measures (4.06), indicating high levels of student compliance and activity in overt learning activities such as task completion and classroom interaction. However, its large standard deviation (0.66) and positive skewness reveal an imbalance beneath this apparent prosperity: the majority of students' behavioral scores were actually below average, with the overall high level driven by a small number of "highly active" students. This means that while instructional instructions were effectively implemented, significant stratification in student engagement exists. Some students may simply be "rotely completing" tasks rather than genuinely engaging. Thus, future BL teaching shouldn't be about what students "do," but rather about making the learning tasks themselves intrinsically engaging. In addition, reduce mechanical and repetitive assignments and increase challenging tasks that require creativity, problem-solving, and independent choice in the future BL class. This will help transform passively compliant students (those with average behavioral scores) into active explorers. Furthermore, future teaching practice should provide timely and specific formative feedback so that students can clearly see the value and progress of their behavioral engagement, thereby strengthening their intrinsic motivation for continued engagement.

The mean emotional engagement value (3.92) is also high, reflecting that most students experienced positive learning experiences, such as interest, enjoyment, and a sense of value. Its negatively skewed distribution also confirms that the majority of students are concentrated in the high-scoring range. However, the largest standard deviation of the three (0.71) raises a critical alarm: students' emotional responses are the most diverse, with significant individual differences. While the majority of emotions are positive, a minority (the lowest score is 2.25) experience relatively negative emotions. These individuals may feel anxious, alienated, or bored, and are at risk of marginalization. The highest-level goal of future teaching is to move from knowledge transfer and thinking training to building a learning ecosystem and emotional care. The teachers should establish mechanisms (such as regular anonymous emotional questionnaires and learning analytics dashboards) to proactively identify students with low emotional engagement and provide personalized care and support, understanding their challenges (such as technical barriers, social difficulties, and academic pressure). Moreover, the teachers should cultivate an emotionally safe community, in which teachers should demonstrate their "social presence" through frequent and positive interactions, encouraging risk-taking and tolerance of mistakes, and striving to build a learning community of mutual respect, support, and trust. This is the soil that nourishes positive emotions.

8. Limitations and suggestions for future research

This study, while insightful, has several limitations. To begin with, the sample is relatively small so that the generalizability of the research findings was restricted. In addition, the samples are from one university, which limited the generalizability to other universities. Future studies should take more samples from various universities to promote generalizability. Lastly, social desirability bias could influence the results because the students will choose what they consider socially acceptable instead of what they really thought. To cope with the problem, further interviews could be conducted to gain a deeper understanding of the students view on the student engagement of BL pronunciation class. Furthermore, to gain a thorough understanding of the students' relatively low cognitive engagement and the mechanisms that lead to high cognitive consistency, interview to probe into these factors influencing the cognitive engagement of BL course is expected in the future to proposed corresponding strategies for improving the quality of BL teaching method. What's more. research should explore the causal relationships between the three engagement dimensions to determine how they influence each other. Finally, conducting longitudinal studies can track changes in student engagement over time, thereby identifying key intervention points for maintaining active engagement and supporting students with learning difficulties.

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