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Academic buoyancy, hope, and behavioral engagement in learning English as a foreign language: A mediation model

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Abstract

With the enhancement of positive psychology movement in educational field, the contributive role of academic buoyancy on academic and well-being outcomes has been validated. However, few studies have been conducted to explore the mediation mechanisms between academic buoyancy and engagement, especially in the field of teaching English as a foreign language (EFL). Inspired by the control-value theory (CVT), this study set out to examine how EFL buoyancy related to behavioral engagement, using a latent structural equation modelling (SEM). Gender, age, and family resources are controlled while validating the hypothesized model of "academic buoyancy—hope—behavioral engagement". The sample comprised 542 students (47.7% female) in their second year of secondary education who responded to survey items in a cross-sectional design. Our findings reveal that academic buoyancy was positively correlated with hope, and behavioral engagement in the EFL settings. Also, it was found that the emotional experience of hope fully mediated the relationships between academic buoyancy and behavioral engagement. The hypothesized model accounts for 79.0% of the variance in EFL hope and 54.5% of the variance in behavioral engagement.

These findings shed light on the influence mechanism of academic buoyancy on behavioral engagement in learning English as a foreign language. Implications, limitations, and directions for future research are discussed.

Keywords: Academic Buoyancy; Behavioral Engagement; Hope; Chinese Secondary EFL Learners

1. Introduction

Academic buoyancy refers to students' ability to handle typical, non-severe academic setbacks, challenges, and difficulties during their daily learning process, and it has a positive impact on academic and well-being outcomes (Bostwick et al., 2022; Hirvonen et al., 2020; Putwain & Wood, 2023; Yun et al., 2018). For instance, In a study with American college students as participants, Thomas and Allen (2021) found that academic buoyancy was significantly and positively correlated with the components of academic engagement, including behavioral engagement. Similarly, the impact of academic buoyancy on academic proficiency has also been validated in the fields of mathematics and foreign language education (Jahedizadeh et al., 2019; Putwain & Wood, 2023). With the deepening of the emotional turn in the field of education, scholars have also explored the relationship between academic buoyancy significantly reduced students' examination anxiety in a sample of English secondary school students. In another study with Chinese high school students, Lei et al. (2021) also established the predictive effect of academic buoyancy on test anxiety.

Emotions are widely acknowledged as the cornerstone of the learning process (Zull, 2006). In their seminal work, Pekrun and his colleagues (2002) catalogued eight frequently encountered emotions encountered during learning activities. Despite this, the prevailing focus within the field of academic buoyancy research has been on its capacity to

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mitigate negative emotional states, particularly anxiety. However, there has been a conspicuous lack of inquiry into whether academic buoyancy can also foster positive emotions, such as hope. This omission warrants further exploration to comprehensively understand the multifaceted role of academic buoyancy in the complex tapestry of student emotional experiences. This study aims to achieve two primary objectives. First, it seeks to examine the correlations between academic buoyancy and positive emotions, such as hope, as well as behavioral engagement within the context of EFL education. Second, it aims to investigate whether positive academic emotions, particularly hope, mediate the relationship between academic buoyancy and behavioral engagement.

2. Literature review

2.1. Academic buoyancy

Academic buoyancy is the ability of students to cope with daily, typical and minor academic setbacks and adversities (Martin & Marsh, 2008a). The concept of academic buoyancy is rooted in academic resilience and is situated within the framework of positive psychology. However, whereas academic resilience pertains to substantial academic challenges, such as severe learning disabilities or extreme socio-economic disadvantages, academic buoyancy is concerned with more routine academic difficulties. These include issues like comprehension problems during lectures, difficulties meeting assignment deadlines, receiving critical feedback from instructors, and experiencing exam anxiety and negative emotional states (Martin & Marsh, 2008a). Among daily stressors, 81% are classified as routine, with daily worries comprising 67% of these (Ross et al., 1999). Consequently, during the learning process, students predominantly face everyday pressures and setbacks. This underscores the importance of investigating the benefits of academic buoyancy, as it addresses these prevalent and routine challenges.

Enhancing students' academic buoyancy not only equips them to manage everyday setbacks and academic challenges more effectively but also positively influences key indicators of academic success and overall well-being (Hoferichter et al., 2021; Lei et al., 2022; Miller et al., 2013). Previous research has predominantly conceptualized academic buoyancy as a domain-general construct (e.g., Colmar et al., 2019). Nevertheless, emerging evidence suggests that academic buoyancy demonstrates domain-specific variations across different subjects, including English, science, physics, and chemistry (Malmberg et al., 2013). This study conceptualizes academic buoyancy as a domain-specific construct and examines its impact on EFL-related engagement within the realm of EFL education. Furthermore, it explores whether positive emotion, specifically hope, mediates the relationship between academic buoyancy and EFL-related engagement.

2.2. Hope

Hope is generally defined as a positive and motivational state that involves the expectation of favorable outcomes and the belief in one's ability to achieve goals despite obstacles (Lazarus, 1999). In term of the three-dimensional taxonomy, hope is categorized as a positive, activating, outcome-related emotion (Pekrun et al., 2007). With the advent of positive psychology, research has increasingly shifted focus from solely addressing negative emotions such as anxiety and boredom to enhancing positive emotional experiences, including hope, among students. However, since Snyder et al. (2003) first introduced hope into the educational domain, research exploring its relationship with learning has been comparatively limited relative to studies on emotions such as anxiety, enjoyment, and boredom. A notable reason for this paucity is the predominant view of hope as a protective factor, primarily recognized for its beneficial effects on illness prevention and recovery (Snyder et al., 2000).

Hope exhibits a stronger predictive effect on academic achievement compared to intelligence, personality, and prior academic performance (Day et al., 2010). Its capacity to predict academic outcomes and the associated influencing factors are of considerable research significance. Griggs and Crawford (2017) demonstrated that hope positively influences self-evaluations and emotional well-being, as evidenced by a study conducted with first-year students. In a study of middle school students in the Dominican Republic, Tomás et al. (2020) found that hope, akin to academic self-efficacy, positively influences academic performance, either directly or indirectly through dimensions of engagement. Given the critical role of hope in academic success and well-being, considerable scholarly attention has been devoted to identifying its antecedents (Crespo et al., 2013; González et al., 2017; Shek et al., 2017; Titsworth et al., 2013). For instance, a study involving New Zealand adolescents aged 9 to 16 indicates that connectedness to family and school positively impacts levels of hope(Crespo et al., 2013). Also, the individual factor of school psychological capital (Kang & Wu, 2022b) and social factor of teacher-student relationship quality (Goetz et al., 2021) were also identified as influencing hope.

2.3. Behavioral engagement

Academic engagement reflects academic motivation (Martin et al., 2017) and is characterized by four dimensions: behavioral engagement, emotional engagement, cognitive engagement, and agentic engagement (Ben-Eliyahu et al., 2018; Reeve & Tseng, 2011). Behavioral engagement is particularly pivotal, as it serves as the primary conduit through which the other three dimensions affect academic outcomes (Y. Yang et al., 2021). Behavioral engagement encompasses a multidimensional construct that includes classroom conduct, participation in school-related activities, and interest in academic pursuits (Hospel et al., 2016; Nguyen et al., 2018). Within this framework, classroom conduct and participation in school-related activities exemplify the passive dimension of behavioral engagement, often responding to teacher directives. Conversely, interest in academic tasks embodies the active dimension of behavioral engagement.

Given the critical role of behavioral engagement in academic success, extensive research has been undertaken to elucidate its antecedents. For instance, in line with control-value theory, positive achievement emotions—such as enjoyment and hope—have been shown to be positively associated with behavioral engagement (Feng & Hong, 2022; Liu, 2022; Murphy et al., 2019). Additionally, numerous studies have validated the predictive effect of academic buoyancy on behavioral engagement (Hirvonen et al., 2020; Thomas & Allen, 2021). Drawing on existing reviews regarding the predictive effects of academic buoyancy on emotions (e.g., Putwain et al., 2015, 2016), it can be inferred that achievement emotions, such as hope, may mediate the relationship between academic buoyancy and behavioral engagement.

2.4. The present study

The predictive effects of academic buoyancy on academic emotions, as well as the role of these emotions in predicting behavioral engagement, have been empirically substantiated. However, the integration of these two models to validate the mediating role of emotions between academic buoyancy and behavioral engagement remains limited, particularly within the context of EFL education. Given this background, the current study seeks to investigate the correlations between academic buoyancy, hope, and behavioral engagement, alongside exploring the mediating effect of hope in the relationship between academic buoyancy and behavioral engagement, within a sample of Chinese secondary EFL learners. Specifically, this study seeks to test and validate the following two hypotheses (refer to Fig. 1).

Hypothesis 1: Academic buoyancy is positively correlated with both hope and behavioral engagement in the EFL settings.



Hypothesis 2: Hope mediates the relationships between academic buoyancy and behavioral engagement.

Figure 1 Hypothesized structural model

Considering that demographic variables such as age, gender, and family resources have predictive effects on achievement emotions and engagement (Kessels et al., 2014; Meyer & Schlesier, 2022; Rozek et al., 2019), it is anticipated that the above hypotheses will remain valid even after controlling for these covariates. In other words, gender, age, and family resources serve as covariates in the SEM analysis.

3. Method

3.1. Participants

Using convenience sampling, we recruited 542 seventh and eighth grade students from a secondary school in Foshan for a questionnaire survey. Before participation, students signed a written consent form, and verbal consent was obtained from their parents. The sample included 284 boys (52.3%) and 259 girls (47.7%). Participants were aged between 12 and 14 years, with a mean age of 12.95 (SD = 0.77).

3.2. Measures

3.2.1. EFL buoyancy scale

The academic buoyancy scale, developed by Martin and Marsh (2008b), was employed to assess participants' levels of buoyancy in English class. Due to the domain specificity of academic buoyancy, we adapted the original domain-general scale to make it suitable for measuring academic buoyancy in the context of English as a Foreign Language. For example, the original item "I don't let study stress get on top of me" was revised to "I don't let English study stress get on top of me." This scale has demonstrated favorable psychometric properties in existing research (Putwain et al., 2016, 2020; Yun et al., 2018). The four-item scale demonstrated a good internal consistency in this study with Cronbach's $\alpha = .82$ (see Table 1). In the SEM analysis, EFL buoyancy was treated as a latent variable.

3.2.2. EFL Hope scale

Participants' emotional feeling of hope in English class was measured by the four item adapted from the achievement emotions questionnaire (AEQ) (Pekrun et al., 2011). Achievement emotions are domain-specific constructs, necessitating the adaptation of original items to align with the context of English language learning. For instance, an adapted item might read, "I am full of hope in learning English." The AEQ has been extensively employed in empirical research and exhibits robust psychometric properties (Kang & Wu, 2022b; Nieto et al., 2024; Stark et al., 2018; K. Wang et al., 2024). In this study, factor loadings ranging from .69 to .93 and Cronbach's alpha coefficient of .91 indicate that the items of the scale are strongly aligned with the construct of EFL hope and that the scale exhibits high internal consistency. EFL hope was considered as a latent variable in the SEM analysis.

3.2.3. Behavioral engagement scale

Participants' behavioral engagement in English classes was assessed using a four-item scale adapted from the *Engagement vs. Disengagement with Learning Questionnaire* (Skinner et al., 2009). The original scale was also revised (e.g., "I try very hard in English learning"). The behavioral engagement scale, comprising four items, has demonstrated strong psychometric properties in previous studies (Engels et al., 2016; Kang & Wu, 2022a; P. J. Yang & Lamb, 2014). In the present study, the behavioral engagement scale demonstrated strong internal consistency, with a Cronbach's alpha of .90.

3.3. Data analysis

The data for this study were collected from students who participated in the questionnaire survey. To address the potential issue of common method bias, we employed Harman's single factor test to assess common method variance (Podsakoff et al., 2003). Data analysis proceeded in several stages. Initially, descriptive statistics were gathered to provide preliminary insights. Skewness and kurtosis of the data were assessed to ensure suitability for maximum likelihood (ML) estimation. Confirmatory factor analysis (CFA) was then employed to evaluate the measurement model's properties. Gender, age, and family resources were subsequently incorporated into the CFA as manifest variables to generate bivariate correlations. Following this, structural equation modeling (SEM) was utilized to investigate the relationships between buoyancy, hope, and behavioral engagement. Additionally, mediation effects were tested using a bootstrap procedure with 5000 resamples and 95% bias-corrected confidence intervals (CIs). An indirect effect was deemed significant if the CIs did not include zero (Tofighi & Kelley, 2020).

4. Results

4.1. Common method bias

A single-factor confirmatory factor analysis (CFA) incorporating all items from the latent variables—buoyancy, hope, and behavioral engagement—exhibited a markedly poor fit, with $\chi^2(44) = 930.961$, p < .001, CFI = .819, TLI = .773, RMSEA = .193, 90% CI [.182, .204], and SRMR = .077. These results suggest that common method bias is unlikely to be a significant concern in the dataset.

4.2. Descriptive statistics

The results of the descriptive statistics are presented in Table 1. According to the criteria established by Roever and Phakiti (2017) (|skewness| < 2, |kurtosis| < 2), all variables met the required conditions for normality, making them suitable for maximum likelihood (ML) estimation. The mean scores indicated that participants reported high levels of EFL buoyancy (M = 3.74/5.00, SD = 0.81), hope (M = 3.78/5.00, SD = 0.89), and behavioral engagement (M = 3.90/5.00, SD = 0.81) in EFL class. Additionally, as shown in Table 1, the internal consistency coefficients for all latent variables were satisfactory. In this study, the independent variable is EFL buoyancy, the mediators are students' hope in EFL classes, and the dependent variable is behavioral engagement in EFL classes. Gender, age, and family resources are considered additional variables.

	Mean	SD	Skewness	Kurtosis	Cronbach's α	Factor loadings
EFL buoyancy	3.74	0.81	-0.12	-0.55	0.82	0.65-0.87
EFL hope	3.78	0.89	-0.32	-0.46	0.91	0.69-0.93
Behavioral engagement	3.90	0.81	-0.34	-0.41	0.90	0.71-0.93

Table 1 Descriptive statistics for the study variables

4.3. Measurement models and latent bivariate correlations

An initial measurement model was constructed with four indicators each for EFL buoyancy, hope, and behavioral engagement. This confirmatory factor analysis (CFA), along with all subsequent analyses, was conducted using *M*plus 8.3 (Muthén & Muthén, 2017) and assessed through various fit indices. These indices included the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). The model demonstrated acceptable fit for all latent constructs, according to conventional criteria for excellent and adequate fit: (a) CFI and TLI values ≥ 0.95 and ≥ 0.90 , respectively; (b) RMSEA values ≤ 0.06 and ≤ 0.08 ; and (c) SRMR values ≤ 0.08 and ≤ 0.10 (F. F. Chen, 2007; Hu & Bentler, 1999; J. Wang & Wang, 2019). According to these criteria, the measurement model exhibited a good fit to the data, with $\chi^2(51) = 271.199$, *p* < .001, CFI = .957, TLI = .944, RMSEA = .089, SRMR = .053. Additionally, the standardized factor loadings from the measurement model were satisfactory, ranging from 0.57 to 0.89 (see Table 1), all exceeding the acceptable threshold of 0.40 (Clark & Watson, 1995).

Table 2 Results of correlations matrix for the study variables

	1	2	3	4	5
1 EFL buoyancy	-				
2 EFL hope	0.89***	-			
3 Behavioral engagement	0.69***	0.73***	-		
4 Gender	-0.08	-0.01	0.05	-	
5 Age	-0.04	-0.05	0.00	0.07	-
6. Family resources	0.11*	0.14**	0.16***	-0.05	0.03

Note. **p < .01; ***p < .001.

Gender, age, and family resources were incorporated into the measurement model as manifest variables. The extended model also demonstrated a good fit to the data, with $\chi^2(78) = 303.527$, p < .001, CFI = .956, TLI = .941, RMSEA = .073, SRMR = .045. The latent bivariate correlations derived from this model are detailed in Table 2. Specifically, EFL buoyancy was positively associated with both hope and behavioral engagement, while hope was positively related to behavioral engagement in the EFL class.

4.4. Structural equation modelling

A SEM was employed to evaluate the model delineated in Figure 1, incorporating gender, age, and family resources as covariates. In this study, the hypothesized model demonstrated good fit to the data with $\chi^2(81) = 313.612$, p < .001, CFI = .954, TLI = .942, RMSEA = .073, and SRMR = .055. Figure 2 illustrates this model with standardized regression coefficients. As illustrated in Figure 2, the analysis yields four key findings. First, EFL buoyancy exerts a positive influence on EFL hope (β = .89, *SE* = .02, p < .001). Second, EFL hope, as hypothesized, positively predicts behavioral engagement in English class (β = .52, *SE* = .14, p < .001). Third, the control variables exhibit significant associations with the study variables. Gender (0 = male, 1 = female) was positively associated with EFL hope (β = 0.06, SE = 0.03, p < 0.05) and behavioral engagement (β = 0.07, SE = 0.03, p < 0.05), indicating that female students were more likely to express hope in English class and to engage more actively in learning English. Additionally, family resources were positively related to both foreign language hope (β = 0.06, SE = 0.03, p < 0.05) and behavioral engagement (β = 0.07, SE = 0.04, p < 0.05). Fourth, the proposed model accounted for substantial proportions of the variance in both foreign language hope and 54.5% of the variance in behavioral engagement. These results indicate that the model provides a strong explanatory framework for understanding these constructs.



Figure 2 Structural equation model testing the relationship among EFL buoyancy, hope and behavioral engagement. All the correlations and path coefficients shown in the figure are standardized, and dotted line denotes insignificant coefficients. *** p < .001; * p < .05.

To assess the mediation effect, a bootstrap procedure with 5,000 re-samples was utilized. Mediation significance was determined by whether the 95% confidence intervals (CIs) excluded zero. As presented in Table 3, the 95% CIs for the mediating effect of EFL hope on behavioral engagement do not encompass zero (95% CIs [.62, .75]), thereby confirming with 95% confidence that EFL hope significantly mediates the relationship between EFL buoyancy and behavioral engagement. In contrast, the direct effect of EFL buoyancy on behavioral engagement was not significant, as evidenced by the 95% CIs [-.06, .48]. This finding indicates that EFL hope fully mediates the relationship within the proposed model.

Table 3 Results of mediation analysis

Model path		SE	Bias-corrected CIs 95%	
			Lower	Upper
Total effect	0.68	0.03	0.62	0.75
Indirect effect: Buoyancy \rightarrow Hope \rightarrow Behavioral engagement	0.46	0.13	0.23	0.72
Direct effect	0.23	0.14	-0.06	0.48

Note. Bolded CIs considered significant (values do not include zero).

5. Discussion

This study aims to elucidate the mechanisms through which EFL buoyancy influences behavioral engagement in English classes. Specifically, it seeks to determine both the direct effects of EFL buoyancy on behavioral engagement and its indirect effects mediated through EFL hope, using a sample of Chinese secondary EFL learners. The study revealed that EFL hope fully mediated the relationship between EFL buoyancy and behavioral engagement in English classes, after accounting for gender, age, and family resources. This study makes a theoretical contribution by providing empirical support for the control-value theory. It demonstrates that academic buoyancy can be considered an antecedent of achievement emotions, which, in turn, are positively correlated with academic engagement. Also, this study offers practical contributions by identifying pathways to enhance students' experiences of hope, which subsequently fosters increased behavioral engagement.

First, the present study reveals a positive correlation between EFL buoyancy and both EFL hope and behavioral engagement, thereby affirming the first hypothesis of the research. This finding aligns with existing research, validating the positive effects of academic buoyancy on favorable academic emotions (Xu & Wang, 2024) and behavioral engagement (Thomas & Allen, 2021). The study makes three notable contributions. First, it frames academic buoyancy as a domain-specific construct and demonstrates its beneficial impact on hope in EFL contexts, thereby offering insights into enhancing learners' experiences of hope throughout the English learning process. This finding suggests that students with a buoyant disposition exhibit greater optimism towards mastering English. Second, buoyancy has been identified as a predictive factor of behavioral engagement, thereby providing a basis for interventions designed to enhance students' academic achievement through the improvement of their behavioral involvement. In other words, students exhibiting buoyancy are likely to manifest elevated levels of engagement in English-related activities. Third, current research on academic buoyancy and academic emotions is relatively sparse, predominantly addressing the mitigation of negative emotions such as anxiety (Lei et al., 2021; Putwain et al., 2015, 2016, 2023), and largely neglecting the role of academic buoyancy in fostering positive emotions. This study seeks to fill this gap in the literature.

Second, this study reveals that EFL buoyancy exerts a direct effect on behavioral engagement and an indirect effect through the mediator of EFL hope, thereby providing empirical support for Hypothesis 2. Aligning with the theoretical assumptions of control-value theory (Pekrun, 2006), this study, viewed through the lens of hope emotions, substantiates the beneficial impact of positive emotions on behavioral engagement. The mediating role of hope in the relationship between buoyancy and behavioral engagement has been substantiated, making a dual contribution to the literature. Firstly, this study validates academic buoyancy as a precursor to achievement emotions (Xu & Wang, 2024). This finding, in conjunction with the theoretical assumptions of control-value theory, enhances the framework of the model and provides educators with a deeper understanding of the antecedents and consequences of academic emotions. Secondly, the confirmed mediating role of hope between academic buoyancy and behavioral engagement serves to enhance educators' comprehension of the reasons behind buoyant students' heightened participation in learning activities. As documented by Putwain et al. (2023), the possible reason is buoyant learners demonstrate superior ability to navigate difficulties and setbacks in the learning process, which facilitates the maintenance of elevated levels of hope and subsequently fosters more active engagement in learning activities.

6. Implications, limitations, and directions

Our study addressed the domain-specific characteristics of academic buoyancy by adapting this variable to the context of EFL education. We developed and validated the "academic buoyancy \rightarrow achievement emotions \rightarrow engagement" framework, thereby contributing novel empirical evidence to the control-value theory. This study presents three key implications for future research. First, in line with the growing focus on positive psychology within the educational field, our findings affirm the predictive role of academic buoyancy in fostering positive emotions like hope. This addresses a

notable gap in the literature, which has largely concentrated on the role of academic buoyancy in mitigating negative emotions. Second, from a pedagogical perspective, our results indicate that enhancing students' buoyancy through strategies such as developing robust teacher-student relationships (She, 2005), increasing parental involvement (M. Chen & Mok, 2023), and engaging empathetically with students during everyday learning activities (Fathi et al., 2024) is an effective means of elevating their experience of positive emotions. Third, EFL hope was found to fully mediate the relationship between EFL buoyancy and behavioral engagement, demonstrating that the effect of EFL buoyancy on behavioral engagement operates indirectly through its influence on students' hope. Although prior research has established a predictive link between academic buoyancy and behavioral engagement (Putwain & Wood, 2023; Thomas & Allen, 2021; Y. Wang & Liu, 2022), this study reveals the underlying mediating mechanism, thereby deepening educators' understanding of how academic buoyancy positively affects behavioral engagement via increased hope. This insight underscores the importance of focusing on enhancing students' hope to improve both their academic buoyancy and behavioral engagement.

While this study exhibits numerous strengths, it is important to acknowledge certain limitations and suggest directions for future research. A notable methodological limitation of this study is its reliance on cross-sectional data. The mediating model established herein suggests a predictive effect of academic buoyancy on behavioral engagement, rather than the reverse. To more precisely delineate the causal relationships between these variables, future research should utilize longitudinal data to further validate these causal connections. By employing hope as a proxy for positive emotions and behavioral engagement as an indicator of academic involvement, the theoretical framework of this study remains incomplete. Pekrun et al. (2002) identified eight commonly experienced emotions, of which enjoyment, pride, and hope are classified as positive. Academic engagement is a multidimensional construct that includes not only a behavioral dimension but also cognitive, emotional, and agentic dimensions (Reeve & Tseng, 2011). Consequently, future research should aim to further refine and empirically validate the "academic buoyancy \rightarrow achievement emotions \rightarrow engagement" theoretical model.

7. Conclusion

This study, utilizing data from 542 Chinese secondary EFL learners, validated the model "academic buoyancy \rightarrow achievement emotions \rightarrow engagement." It was observed that students exhibit varying degrees of capability to navigate academic challenges or difficulties. Those with higher levels of academic buoyancy demonstrate greater hope in their English learning and exhibit higher motivation to participate in English learning activities. Conversely, students with lower levels of academic buoyancy show reduced hope and diminished behavioral engagement. To address these disparities, it is recommended that stakeholders collaborate—through measures such as fostering robust teacher-student relationships, enhancing parental involvement, and providing peer support—to improve students' academic buoyancy. This, in turn, is expected to enhance their hope and subsequently increase their behavioral engagement in English learning activities.

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