International Journal of Learning, Teaching and Educational Research
Vol. 22, No. 8, pp. 203-232, August 2023
https://doi.org/10.26803/ijlter.22.8.12
Received Jun 28, 2023; Revised Aug 18, 2023; Accepted Aug 23, 2023

Relationship between Student Engagement and Academic Achievement in College English Education for Non-English Majors in China

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Abstract. To address the tangible problem of English underperformance and recognize a theoretical void in student engagement theory within the realm of college-level English education for non-English majors in China, this research investigated the correlation between student engagement and English achievement in this unique setting. Additionally, it analyzed to what degree the trio of student engagement dimensions (specifically, emotional engagement, cognitive engagement, and behavioral engagement) elucidate or forecast students' accomplishments in English. The correlation study design was adopted with 400 non-English major undergraduates in 6 public universities and colleges in Hebei Province, China. Students' CET-4 scores served as indicators to assess academic achievement, which was collected in the Demographic Information Form. The Student Engagement Scale collected data on three dimensions of student engagement. Through comprehensive statistical analyses, the outcomes demonstrated substantial and positive correlations between (the three dimensions of) student engagement and English achievement in the domain of college English education for non-English majors in China. Notably, these dimensions collectively elucidate 65.3% of the variation in English achievement, with emotional engagement emerging as the primary predictor, succeeded by behavioral engagement and cognitive engagement. These findings not only suggest a path for tackling the practical issue but also expand the application boundaries of student engagement theory. As subsequent research delves into the intricacies of student engagement, this study establishes a foundation for delving deeper into the mechanisms that propel English achievement within this distinctive educational landscape.

Keywords: student engagement; academic achievement; college English education; non-English major

1. Introduction

International language proficiency has been recognized by the United Nations as one of the fundamental developmental and survival skills for individuals in this century, particularly for people in developing countries like China (Wang, 2015). China places significant importance on English education at all levels, including college English education, which serves as the final opportunity for most young people to systematically learn English in a classroom setting. Unlike English majors, who comprise only a minority of students, the English proficiency of non-English majors in various industries holds considerable significance for the development of Chinese society. The significance of English achievement extends to the prospective job opportunities and advanced academic pursuits of students not specializing in English.

While progress has been made in understanding potential predictors of academic achievement in college English education for non-English majors in China, much of the focus to date has been on external factors, for instance, teachers' teaching styles on non-English majors' academic achievement (Wang, 2013); the function of teachers in establishing a conducive atmosphere for learning (Wang & Kang, 2015); the connection between teacher feedback and student motivation in English learning (Wang & Liu, 2015); and the teacher-student relationship (Liu, 2015). However, non-English major students' college English achievements remain unsatisfactory (Liu, 2020; Wang, 2015), a situation which has prompted the Ministry of Education of China to call for more solutions from educators and researchers.

In response to feedback from front-line teachers and scholars regarding current issues in college English education for non-English majors, one striking concern which may link to students' underachievement is their disengagement in the classroom. According to student engagement theory, students' engagement in their learning journey has a direct influence on their academic achievement (Fredericks et al., 2016; Kuh, 2009). Student engagement, characterized by learners' active and psychological commitment to the educational process, is a multidimensional concept that encompasses three primary dimensions: emotional, cognitive, and behavioral engagement (Hasanov et al., 2021). The issues existing in college English classrooms for non-English majors in China reflect various dimensions of disengagement. For instance, passive learning behaviors (Jiang, 2021;Wu, 2021), such as ignoring questions, remaining silent, and lack of active participation, are indicative of low behavioral engagement. The perception of college English courses as boring or irrelevant (Liu & Yang, 2022), is likely to reduce emotional engagement. Additionally, the tendency to mechanically repeat the basic learning process without seeking improvements or a suitable learning style (Feng, 2021), is linked to cognitive engagement. In this context, student engagement theory offers a potential explanation for the underachievement of non-English majors in English. The specificities of the college-level English classroom for non-English majors provide an appropriate research context for the practical application of student engagement theory.

In recent decades, numerous studies have provided empirical support for the

correlation between student engagement in the learning process and the attainment of desired learning outcomes. Some scholars have even argued that the impact of student engagement on academic achievements surpasses that of other predictive factors (Wang, 2011). However, most of the existing evidence primarily focuses on general education at the school level, rather than on specific subjects (e.g., Fredericks et al., 2004; Gunuc, 2014; Lei et al., 2018; Li & Bai, 2018; Xie, 2018). The scant pertinent inquiries conducted in the realm of English education in China have primarily directed their focus on middle and high schools (e.g., Lu, 2019; Han, 2019; Piao, 2017; Yang, 2018; Zhong, 2020) and limited research has been conducted to the impact of student engagement on academic achievements in college English education for non-English majors in China. Since student learning is context-dependent (Kahu, 2013), the influence of student engagement on academic achievements is not context-free. Hence, the execution of an empirical investigation is imperative to ascertain the link between student engagement and academic achievement within a distinct context that extends beyond the existing literature.

Hence, this current study aims to provide a new perspective for addressing practical issues in college English education for non-English majors in China through an empirical outlook on the relationship between student engagement and students' academic achievements. To delve into specifics, this study aims to explore the following research questions:

1) What is the relationship between the different dimensions of student engagement (emotional, cognitive, and behavioral engagement) and academic achievement in college English education for non-English majors in China?

2) To what extent do the three dimensions of student engagement (emotional, cognitive, and behavioral engagement) explain or predict students' English achievement?

2. Literature Review

2.1 Student engagement

Student engagement is a concept that has been extensively theorized and studied in the field of education, with its development spanning decades. It encompasses students' active and meaningful involvement in their educational experiences, reflecting their dedication, interest, and commitment to the learning process (Boekaerts, 2016). Scholars and educators widely acknowledge student engagement as a pivotal element in shaping educational outcomes and fostering a positive learning environment (Fredericks et al., 2016; Kuh, 2009; Strayhorn, 2018).

The precise definition of student engagement and its dimensions has been subject to extensive debate among scholars; however, there exists a general agreement that student engagement embodies a multidimensional concept with the three-dimensional construct proposed by Fredericks, Blumenfeld, and Paris (2004) being the most widely recognized and used version (Burch et al., 2015; Hasanov et al., 2021). According to this construct, student engagement encompasses three dimensions: emotional, cognitive, and behavioral engagement. This division aligns with Kahu's (2013) definition of holistic

student engagement, which refers to emotional connection to the institution (emotional), committed self-learning with extra effort for deeper understanding (cognitive), and proactive involvement in both formal and informal educational activities (behavioral). This three-dimensional concept has been found applicable in the context of university education in China by previous scholars (Yang & Han, 2014). Thus, the current study has decided to adopt this three-dimensional framework.

Emotional engagement, viewed from a psychological perspective, refers to the effort students put into their learning process and encompasses their positive and negative emotional responses toward teachers, peers, learning tasks, and classes (Kahu, 2013); this includes emotions such as happiness, tiredness, excitement, boredom, and others (Gunuc & Kuzu, 2014; Pekrun et al., 2017). *Cognitive engagement*, also examined from a psychological standpoint, distinguishes a student's effort in the learning process as either substantive or procedural (Fredericks et al., 2016). It consists of two components: the utilization of cognitive and metacognitive strategies. Cognitive strategy use entails combining prior knowledge with novel information and employing diverse techniques to improve memory and comprehension (Xu et al., 2020). Metacognitive strategies use pertains to how students set goals, adjust their learning approaches, and maintain a strong work ethic (Fredericks et al., 2016). From a physical perspective, *behavioral engagement* pertains to the visible conduct exhibited by students throughout the learning process (Christenson et al., 2012). It encompasses basic conduct such as attendance rates (Li & Lerner, 2013), task-related behaviors such as sustained attention to learning tasks (Guo et al., 2015), and participatory behaviors such as active involvement in activities and cooperation with classmates (Sang & Hiver, 2021).

The theoretical framework underpinning the current study is anchored in the construct of student engagement and draws upon the paradigm of student engagement theory, which postulates that the dimensions of emotional, cognitive, and behavioral engagement converge in an intricate interplay, synergistically influencing and contributing to students' academic achievements (Kahu, 2013; Wang & Eccles, 2012). Positive engagement in all dimensions is expected to result in improved academic outcomes (Fredericks et al., 2016). This framework serves as the guiding structure for exploring the relationship between student engagement and academic achievement in college English education for non-English majors in China.

2.2 Academic achievement

Academic achievement serves as a direct gauge of learning outcomes and represents the level of accomplishment attained by students, teachers, and educational institutions in relation to their school-related work (Sedaghat et al., 2011). The concept of academic achievement can be understood in both broad and narrow senses.

The broad definition of academic achievement refers to the demonstrated level of knowledge, skills, and competencies acquired by an individual as a result of

their engagement in educational activities within a formal academic setting. It typically encompasses the successful completion of assignments, assessments, tests, and projects, as well as the acquisition of subject-specific knowledge and the cultivation of critical thinking and problem-solving capabilities (UNESCO, 2021). In contrast, the narrow definition of academic achievement pertains to students' performance in specific academic examinations, reflecting their skills and knowledge in a particular subject area (Liao & Chen, 2014). In other words, the narrow definition of academic achievement typically refers to students' test scores.

It is evident that the broad definitions of academic achievement prioritize students' comprehensive learning abilities at a holistic education level rather than their mastery of knowledge in a specific subject. However, for the purposes of this study, which focuses solely on English learning outcomes in college education, a narrow definition of academic achievement is adopted. Specifically, academic achievement in this study refers to the scores obtained by non-English major undergraduates in examinations that reflect their English proficiency at the university level. Currently, the most authoritative and standardized examination used to assess the college English achievement of non-English majors in China is the College English Test Band 4 (CET-4; Sheng & Zhang, 2015). Organized by the Ministry of Education in China, the CET-4 aims to objectively and accurately reflect the outcomes of non-English majors in college English education (Ministry of Education of China, n.d.). Therefore, the current study employed the participants' CET-4 scores as the indicator of academic achievement.

2.3 Student engagement and academic achievement

One of the key outcomes associated with student engagement is academic achievement (Fredericks et al., 2016; Lei et al., 2018). Compared to other dependent variables, the influence of student engagement on academic achievement appears to be relatively more significant (Wang, 2011). Previous studies have made substantial progress in testing the association between these two factors, with numerous empirical studies demonstrating notable positive correlations between overall student engagement and academic achievement (e.g., Gunuc, 2014; Li & Bai, 2018; Xie, 2018). A meta-analysis conducted by Lei, Cui, and Zhou (2018) synthesized findings from 69 independent studies involving a total of 196,473 participants, also confirming a moderately positive relationship between student engagement and academic achievement. In this context, "overall student engagement" refers to the comprehensive notion of student engagement that encompasses all its dimensions.

Besides researching the correlation between overall student engagement and academic achievement, there have been studies delving into the connection between individual dimensions of student engagement (emotional, cognitive, and behavioral) and academic success. Among the three dimensions, there is a greater volume of literature on behavioral engagement with several studies indicating that students' behavioral engagement, whether positive or negative, has a notable influence on their academic achievement (Gunuc, 2014; King, 2015). Positive behaviors are associated with desirable academic outcomes,

while negative behaviors are linked to poorer achievement (Wang & Fredericks, 2014). Indicators encompassed within behavioral engagement, such as students' attendance (Sekiwu et al., 2020), active learning, cooperative learning, and conscientious and attentive learning (Wang & Holcombe, 2010), have additionally been recognized as predictors of academic achievement. These studies highlight the significance of behavioral engagement in influencing students' academic outcomes, indicating that specific behaviors demonstrated during the learning process can contribute to academic achievement.

Indeed, emotional engagement is considered elementary for effective learning (Skinner & Pitzer, 2012). Research exploring the connection between emotional engagement and academic achievement consistently reveals a significant and positive correlation (King, 2015; Lei et al., 2018). Positive emotional engagement has been identified as advantageous for students in achieving academic accomplishments (Wara et al., 2018). Furthermore, specific indicators related to emotional engagement have also exhibited significant correlations with students' academic achievement. For example, students' attitudes toward their teachers and peers have been found to influence their academic achievement (Kpolovie et al., 2014). These findings underscore the role of emotional engagement in students' academic success, suggesting that positive emotional experiences and attitudes contribute to better academic achievements.

Cognitive engagement, the third dimension of student engagement, is frequently regarded as more challenging to assess compared to emotional and behavioral engagement (Fredericks et al., 2004). Although there is relatively less literature on cognitive engagement, research has showed a positive correlation between it and academic achievement (Al-Alwan, 2014; Gunuc, 2014; Kamla-Raj & Ugur, 2015; Pietarinen et al., 2014). These studies suggest that students who actively engage in cognitive activities like critical thinking, problem-solving, and knowledge integration tend to secure higher academic achievements.

However, despite the extensive empirical research conducted on the correlation between student engagement and academic achievement, the results up to now have been inconclusive. inconsistent. On the other side of the discussion, some researchers hold different perspectives. For instance, Li and Lerner (2013) conducted a study among adolescents and reported that, while emotional engagement exhibited a positive correlation with academic achievement, the connection between cognitive engagement and achievement was not significant. Likewise, Kuh and Vesper (2018) examined college students and found that, while there were positive associations between cognitive and behavioral engagement and academic achievements, emotional engagement did not yield significant correlations. Chen et al. (2013) also found that the relationship between student engagement and achievement lacked statistical significance. These divergent findings all contribute to the ongoing discourse surrounding the topic.

Most of the existing relevant studies have focused on the whole-school level, with only a limited number examining this topic within the context of English

language education. Attendance in English class has been identified as an important predictor of English achievement (Bahar, 2015; Kelsen & Liang, 2012). Additionally, according to Syaveny and Johari (2017), emotional and behavioral engagement indicators have demonstrated a positive correlation with English achievement. However, Shernoff (2010) reached a different conclusion, stating that emotional engagement did not exhibit a significant relationship with English achievement, while Zhong (2020) also found that a significant relationship between cognitive engagement and students' English achievements was not present. These diverse finding, scoupled with the relatively small number of studies in this particular context, highlight the scarcity and immaturity of research on concerning the link between student engagement and academic achievement in the field of English language education.

Chinese scholars have also explored the connection between student engagement and academic achievement within the English education context. Nonetheless, most of these studies have predominantly centered around junior high school (Han, 2019; Yang, 2018; Zhong, 2020) and senior high school (Lu, 2019; Piao, 2017) settings. As such, the examination of student engagement in college English education for non-English majors in China remains understudied. Consequently, it is imperative that additional empirical investigations be undertaken to enhance our understanding of the specific relationship between student engagement and academic achievement within the unique framework of college English education for non-English majors in China.

Referring to the literature review, A hypothesis was developed for the first research question:
H1: A significant positive relationship exists between the three dimensions of student engagement (emotional, cognitive, and behavioral engagement) and their academic achievements in college English education for non-English majors in China.

3. Methodology

3.1 Research design

A correlation study, which is typically employed to examine the relationship between preexisting variables (Fraenkel et al., 2012), was employed in this study. More specifically, an explanatory design was selected as it enabled the investigation of a specific research question and facilitated the provision of a definitive conclusion in response to that question (Cresswell, 2012).

3.2 Setting and participants

Data for this study were gathered from multiple public colleges and universities located in Hebei Province, China. Following the recommendation of Fraenkel, Wallen, and Hyun (2012), a cluster random sampling technique employing the fish bowl method was utilized to randomly select six public universities or colleges from a total of 32 in Hebei Province. The exact number of participants (n=400) was determined using Cochran's (1977) formula for continuous data and followed Salkind's (2006) advice to draw an extra sample size of 40-50% to counteract the potential non-response error. The study employed random

sampling to choose 400 participants from the six selected public universities. Participation in this study was completely voluntary, and steps were taken to guarantee participant anonymity. Students without CET-4 scores were excluded from the participants, as CET-4 scores served as the indicator for assessing academic achievement in this study. Moreover, to ensure data equality and timeliness, the study required that participants' CET-4 scores were obtained from the winter examination of 2021. Thus, only non-English major undergraduates who had taken the CET-4 exam and received scores in the specified timeframe were eligible to participate.

Table 1 displays the demographic profiles of the 400 respondents.

Table 1: Demographic profiles of the respondents (n=400)

Gender	**Frequency (n=400)**	**Percentage (%)**
Male	158	39.5
Female	242	60.5
Total	**400**	**100**
Age group (years old)	**Frequency (n=400)**	**Percentage (%)**
17-19	175	43.75
20-22	157	39.25
23-25	62	15.5
Over 25	6	1.5
Total	**400**	**100**
Academic Year	**Frequency (n=400)**	**Percentage (%)**
Second Year	208	52
Third Year	108	27
Fourth Year	84	21
Total	**400**	**100**
University/College	**Frequency (n=400)**	**Percentage (%)**
A	83	20.75
B	71	17.75
C	75	18.75
D	55	13.75
E	60	15
F	56	14
Total	**400**	**100**

3.3 Research instruments

A demographic information form was administered to gather data regarding the respondents' age group (in years), gender, academic year, and university. Additionally, the form included a section to gather information on the respondents' academic achievement, specifically their CET-4 scores.

Student engagement was measured using the Student Engagement Scale, adapted from the School Engagement Measure (SEM)-MacArthur created by Fredericks et al. (2005) and the English Learning Engagement Questionnaire devised by Yang (2018). The SEM-MacArthur is a widely recognized instrument, while the English Learning Engagement Questionnaire was specifically designed for the context of English education in China. These sources provided valuable references in formulating the scale employed in the current study.

The Student Engagement Scale is a self-report questionnaire consisting of 33 items, categorized into three dimensions: emotional engagement (9 items), cognitive engagement (13 items), and behavioral engagement (11 items). Respondents rated their agreement with each statement on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, 5 = strongly agree). Table 2 provides two examples for each dimension within the scale. The scale demonstrated substantial internal consistency, evidenced by Cronbach's alpha coefficients of .926 for emotional engagement, .929 for cognitive engagement, and .891 for behavioral engagement, all surpassing the recommended threshold of 0.7 (Taber, 2018). Elevated scores on the scale signify a greater level of engagement in the college English course, while lower scores suggest poor engagement or disengagement.

Table 2: Examples for each dimensions in the student engagement scale

Dimensions	Examples
Emotional Engagement	I like taking the College English class. I feel happy when taking the College English class.
Cognitive Engagement	When I memorize words or learn knowledge points, I use a variety of methods to help me, rather than using rote memory. I check my coursework for mistakes.
Behavioral Engagement	I follow the rules of the College English class. I do the coursework for College English classes carefully.

Furthermore, the validity of the employed student engagement scale was assessed through three approaches: construct validity, discriminant validity, and convergence validity. Confirmatory factor analysis (CFA) was utilized to assess the construct validity of each dimension of student engagement separately (Awang, 2014). The results demonstrated that all the indices met the predefined cutoff values, affirming the instrument's construct validity. Convergence validity of the scale was evaluated based on the average variance extracted (AVE) and the factor loadings of the items (Hair et al., 2010). In the present study, both the AVE values and the item factor loadings exceeded the 0.5 threshold, indicating satisfactory convergence validity. Discriminant validity of the scale was assessed through correlation coefficients and the square root values of AVE (Hair et al., 2014). In this study, the square root values of AVE exceeded the correlation coefficients between variables, signifying adequate discriminant validity. Overall, the student engagement scale employed in this study exhibited sound validity, as evidenced by its construct validity, convergence validity, and discriminant validity.

3.4 Data collection

The researcher initially obtained verbal consent from selected universities and colleges, outlining the study's aims. Due to ongoing COVID-19 restrictions, distributing paper questionnaires became impractical. Instead, an online questionnaire was established using the platform Wenjuanxing (https://www.wjx.cn/). Following institutional approval, the questionnaire was disseminated to the selected participants via email by their instructors, WeChat, and Tencent QQ.

3.5 Data analysis

SPSS version 26.0 was utilized for statistical analyses, encompassing both descriptive and inferential statistics. Descriptive statistics were employed to assess the participants' CET-4 scores and their level of engagement. Spearman's correlation coefficients, two-step cluster analysis, and independent samples t-test were utilized to investigate the relationships between student engagement and academic achievement. Furthermore, a regression analysis was undertaken to determine the extent to which the different dimensions of student engagement explained their academic achievement. These analyses were performed to provide insights into the associations between student engagement and academic achievements.

4. Findings

4.1 Preparation of the data

The missing data and outliers were initially checked to confirm the data's appropriateness for subsequent multivariate analysis. Upon entering the data into the SPSS 26.0 software package, it was observed that there were no missing values in the dataset. Subsequently, the presence of potential outliers was assessed using the Mahalanobis distance (Md^2) divided by the degrees of freedom (df) value (Md^2/df). The highest Md^2/df value calculated for the current study's dataset was 3.52, which falls below the suggested maximum value of 4 for studies with a participant size greater than 200 (n = 400; Hair et al., 2010). Consequently, no outliers were identified in the dataset.

Prior to conducting the formal analysis, assessments were made to ensure the fulfillment of assumptions crucial to multivariate analyses, such as normality, linearity, homoscedasticity, and multicollinearity (Tabachnick & Fidell, 2012). Normality was evaluated using the Shapiro-Wilk test, histograms, Q-Q plots, and P-P plots (Huck, 2012). The Shapiro-Wilk test is commonly employed to assess normality when the participant size falls between 50 and 2000 (n = 400). A p-value exceeding 0.05 signifies a normal distribution. As presented in Table 3, all p-values fell within the acceptable range, suggesting that the data in the current study follow a normal distribution.

Additionally, scatterplots were examined to evaluate the assumptions of linearity and homoscedasticity in the dataset (Tabachnick & Fidell, 2012). The scatterplots of all variables demonstrated that the dataset adheres to the assumptions of normality, linearity, and homoscedasticity.

Table 3: Shapiro-Wilk test

Shapiro-Wilk test			
	Statistic	df	Sig. (p)
Emotional Engagement	.971	400	.380
Cognitive Engagement	.988	400	.937
Behavioral Engagement	.974	400	.468
Academic Achievement	.962	400	.199

The potential issue of multicollinearity among the three dimensions of student engagement was assessed. Multicollinearity occurs when the correlation coefficient between two predictor variables exceeds 0.9 (Field, 2009). Table 4 displays the correlation coefficients between each pair of dimensions, and it is evident that all coefficients are below 0.9. This suggests that there is no significant multicollinearity present in the dataset.

Table 4: Term-term matrix

	Emotional Engagement	Cognitive Engagement	Behavioral Engagement
Emotional Engagement	1		
Cognitive Engagement	.556**	1	
Behavioral Engagement	.504**	.529**	1

**: Correlation is significant at the 0.01 level (2-tailed).

Furthermore, the regression analysis process included the examination of tolerance and Variance Inflation Factor (VIF) values for each dimension of student engagement. According to Kline (2011), a tolerance value greater than .10 and a VIF value less than 10 are considered acceptable indicators of multicollinearity. Table 5 displays the tolerance and VIF values for each dimension, and all values fall within the acceptable range. This finding further supports the absence of multicollinearity among the variables in this study.

Table 5: Tolerance and VIF values

Dimensions	Tolerance	VIF
EE	.570	1.754
CE	.532	1.880
BE	.575	1.738

4.2 Findings regarding the descriptive statistics

The passing score for the CET-4 examination, as stipulated by the Ministry of Education of China, is 425 or higher (ranging from 425 to 710), which indicates that students who achieve this score receive a certificate indicating their successful completion of the exam. Therefore, in this study, students' CET-4 scores were categorized into two levels: 1) 0–424 (indicating failure to obtain a certificate); and 2) 425-710 (indicating successful certification).

Table 6 displays the distribution of participants' CET-4 scores. It is evident that a substantial portion of participants in this study (84.75%, n = 339) obtained a passing score on the CET-4 exam. Nevertheless, 15.25% of students (n = 61) with relatively lower scores provided data for this study, ensuring the inclusiveness and comprehensive representation of data sources.

Table 6: Distribution of participants' CET-4 scores (n=400)

CET-4 Scores (0-710)	Frequency (n=400)	Percentage (%)
Level 1: 0-424	61	15.25
Level 2: 425-710	339	84.75
Total	**400**	**100**

Table 7 displays the descriptive statistics for participants' CET-4 scores. The recorded scores ranged from a minimum of 296 to a maximum of 680. The mean score was calculated to be 501.17, with a standard deviation of 85.609.

Table 7: Descriptive statistics of CET-4 scores

	N	Minimum	Maximum	Mean	Std. Deviation
CET-4 Scores (0-710)	400	296	680	501.17	85.609

Table 8 illustrates the categorization of student engagement into three tiers: low (1-2.33), moderate (2.34–3.67), and high (3.68–5). The cutoff points for each level were determined based on the mean score, following the approach proposed by Al-Rashidi (2018), Bawaneh et al. (2019), and Alkharusi (2022). The overall student engagement level, as measured by the full scale, was observed to be at a moderate level (M = 3.17, SD = 0.65). The majority of participants (70.25%, n = 281) fell within the moderate level, while 18.25% (n = 73) demonstrated high engagement, and 11.5% (n = 46) displayed low engagement. These findings provide an understanding of the distribution of student engagement levels among the study participants.

Table 8: Level of Student Engagement

Level of Student Engagement (SE)	Frequency (n)	Percentage (%)	Mean (M)	Standard Deviation (SD)
Low (1-2.33)	46	11.5		
Moderate (2.34-3.67)	281	70.25	3.17	.65
High (3.68-5)	73	18.25		

Table 9 provides an overview of the levels of the three dimensions of student engagement: emotional engagement (EE), cognitive engagement (CE), and behavioral engagement (BE). The results indicate that all three dimensions were at a moderate level in the current study (EE: M = 3.08, SD = 0.82; CE: M = 3.19, SD = 0.71; BE: M = 3.25, SD = 0.78). A relatively small proportion of students exhibited low levels of engagement in each dimension (EE: 24.5%, n = 98; CE: 9.75%, n = 39; BE: 13.75%, n = 55), while the proportion of students exhibiting high levels of engagement was also relatively low (EE: 16.25%, n = 65; CE: 24.25%, n = 97; BE: 28.5%, n = 114). The majority of students fell within the

moderate level for all dimensions, comprising 70.25% of overall engagement (n = 284), 59.25% of emotional engagement (n = 237), 66% of cognitive engagement (n = 264), and 57.75% of behavioral engagement (n = 231). These findings suggest that, overall, students demonstrated moderate levels of engagement across the three dimensions in the current study.

Table 9: Level of Different Dimensions of Student Engagement

Level of Emotional Engagement (EE)	Frequency (n)	Percentage (%)	Mean (M)	Standard Deviation (SD)
Low (1-2.33)	98	24.5		
Moderate (2.34-3.67)	237	59.25	3.08	.82
High (3.68-5)	65	16.25		
Level of Cognitive Engagement (CE)	**Frequency (n)**	**Percentage (%)**	**Mean (M)**	**Standard Deviation (SD)**
Low (1-2.33)	39	9.75		
Moderate (2.34-3.67)	264	66	3.19	.71
High (3.68-5)	97	24.25		
Level of Behavioral Engagement (BE)	**Frequency (n)**	**Percentage (%)**	**Mean (M)**	**Standard Deviation (SD)**
Low (1-2.33)	55	13.75		
Moderate (2.34-3.67)	231	57.75	3.25	.78
High (3.68-5)	114	28.5		

4.3 Findings regarding inferential statistics

First, given that engagement ratings are based on Likert scales, Spearman's correlation coefficients were employed to examine the association between academic achievement and student engagement. As shown in Table 10, there were significant relationships between academic achievement and overall student engagement ($r = .808$, $p < .05$), emotional engagement ($r = .713$, $p < .05$), cognitive engagement ($r = .664$, $p < .05$), and behavioral engagement ($r = .671$, $p < .05$). Besides, all the Spearman's correlation coefficients were positive, implying positive relationships between academic achievement and overall engagement, along with its three dimensions. **Thus, all three research hypotheses based on the first research question are accepted.**

Table 10: Spearman's Correlation Between Academic Achievement and Student Engagement

		Emotional Engagement	Cognitive Engagement	Behavioral Engagement	Total-scale
Academic Achievement	Spearman (r_s)	.713**	.664**	.671**	.808**
	p	.000	.000	.000	.000

**: Correlation is significant at the 0.01 level (2-tailed).

The two-step cluster analysis was used to group the participants based on their total student engagement scores into high and low engagement groups. Subsequently, independent sample t-tests were conducted to compare the academic achievement between these two groups.

Table 11 presents the outcomes of the independent sample t-tests. It was found that the variance between the high and low engagement groups was unequal based on Levene's test ($p = 0.000$, $p < 0.05$). Hence, the values from the row with equal variances not assumed were considered. Based on these results, a notable distinction in academic achievement was observed between the high and low engagement groups ($p = 0.000$, $p < 0.05$), with a positive mean difference of 127.217. This finding indicates that students exhibiting elevated levels of engagement achieved higher English achievement, whereas those with diminished engagement levels attained comparatively lower English achievement.

Table 11: Comparison of the Two Groups According to Academic Achievement

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	47.896	.000	17.911	398	.000	127.217	7.103
Equal variances not assumed			21.593	312.903	.000	127.217	5.891

A regression analysis employing the stepwise regression method was executed to evaluate the predictive power of the three dimensions of student engagement (emotional, cognitive, and behavioral engagement) on students' academic achievement in college English education for non-English majors in China. By employing stepwise regression analysis, researchers can identify the variables that offer significant contributions to the prediction or explanation of the outcome variable, thereby forming the most appropriate regression model for the study (Huck, 2012).

The ANOVA test was conducted to evaluate the applicability of the regression models, and all three models (Model 1, Model 2, and Model 3) were found to be statistically significant (Model 1: $F = 387.776$, $p = .000$; Model 2: $F = 323.925$, $p = .000$; Model 3: $F = 248.514$, $p = .000$). These results indicate that the regression models are applicable and can effectively explain the relationship between the predictors (dimensions of student engagement) and the predicted variable (students' academic achievement in college English education for non-English majors in China).

Referring to Table 12, it is evident that Model 3, derived from the third step of the stepwise regression analysis, is the most suitable model. It is statistically

significant, as indicated by the p-values being lower than 0.05 for all variables. Within the trio of student engagement dimensions, emotional engagement (B = 37.592) exhibited the strongest predictive ability for students' academic achievement in college English education for non-English majors in China. Following emotional engagement, behavioral engagement (B = 42.631) was the next significant predictor. Cognitive engagement (B = 29.981) displayed the weakest predictive ability among the three dimensions of student engagement concerning students' academic achievements in college English education for non-English majors in China. Based on the above regression analysis, the following regression equation between predictors and the predicted variable was obtained:

English Achievement = 149.742 + Emotional Engagement * 37.592 + Behavioral Engagement * 42.631 + Cognitive Engagement * 29.981

In short, an increment of one unit in emotional engagement corresponds to a 37.592-unit upsurge in English achievement, while an increment of one unit in behavioral engagement corresponds to a 42.631-unit elevation in English achievement. On the other hand, an increment of one unit in cognitive engagement corresponds to a 29.981-unit enhancement in English achievement. The R^2 values demonstrate that emotional engagement alone explains 49.3% of the variance in academic achievement (M1: R=.702; R^2=.493). With the inclusion of behavioral engagement into the model, the combination of emotional and behavioral engagement collectively accounts for 62% of the variance (M2: R=.787; R^2=.620). Finally, with the inclusion of cognitive engagement, the overall student engagement encompassing all three dimensions explains 65.3% of the variance in academic achievement (M3: R=.808; R^2=.653). These findings underscore the crucial role of student engagement, across its three dimensions, in determining academic achievements in college English education for non-English majors in China.

Table 12: Regression Analysis Regarding Predictors of Academic Achievement.

Model	Predictors	B	Std. err.	Beta	t	p
Model 1[a]	(Constant)	276.826	11.794		23.472	.000
	Emotional Engagement	72.897	3.702	.702	19.692	.000
Model 2[b]	(Constant)	174.422	13.561		12.862	.000
	Emotional Engagement	47.743	3.885	.460	12.290	.000
	Behavioral Engagement	54.712	4.758	.430	11.499	.000
Model 3[c]	(Constant)	149.742	13.582		11.025	.000
	Emotional Engagement	37.592	4.067	.362	9.242	.000
	Behavioral Engagement	42.631	4.959	.335	8.597	.000
	Cognitive Engagement	29.981	4.880	.249	6.143	.000

a. R=.702; R^2=.493; F=387.776; p= .000
b. R=.787; R^2=.620; F=323.925; p= .000
c. R=.808; R^2=.653; F=248.514; p= .000

5. Discussion

The study's findings support the notion that overall student engagement holds a pivotal significance in non-English majors' academic achievement in college English education in China. The positive relationship between engagement and achievement aligns with the findings of some previous research (Chase et al., 2014; Gunuc, 2014; Li & Bai, 2018; Xie, 2018). This empirical evidence reinforces the relevance of these theories in the specific context of English education for non-English majors. Furthermore, the study highlighted that students exhibiting elevated levels of engagement are prone to achieve better academically, while those with diminished engagement levels struggle to score well. This underscores the connection between poor English achievement and low levels of engagement among non-English majors. It suggests that addressing the issue of underachievement in English requires a focus on improving student engagement rather than relying solely on external factors such as teaching methods. Future research should explore strategies to enhance students' English achievement by fostering their engagement in the learning process. By prioritizing student engagement, researchers can better achieve the objective of improving non-English majors' English achievement.

The study also unveiled a positive correlation between students' English achievement and each of the three dimensions of student engagement. This signifies that as students encounter heightened levels of engagement in these dimensions, their English achievement improves accordingly. Therefore, when aiming to enhance students' English achievement through the lens of student engagement, it is crucial to consider all three dimensions collectively (Wang & Holcombe, 2010). These dimensions encompass students' psychological and physical energy and have both shared and unique influences on their academic achievement (Burch et al., 2015; Kahu, 2013). By examining the combined impact of these three dimensions, researchers can gain a holistic comprehension of how engagement contributes to English achievement.

Furthermore, the study found that the three dimensions of student engagement collectively accounted for a significant proportion (65.3%) of students' English achievement. Among these dimensions, emotional engagement emerged as the strongest predictor, emphasizing its crucial role in student learning. This finding is consistent with Yang's (2018) research, which emphasizes the strongest impact of attitudes and emotions on promoting English learning in junior high schools in China. Given the limited class hours for non-English majors, the role of emotional engagement becomes even more critical. Positive emotions, encompassing feelings like interest, enjoyment, and enthusiasm, propelling students to dedicate extra time and exertion to learning English beyond the classroom setting (Pekrun et al., 2017). This, in turn, contributes to better English achievements. This revelation underscores the significance of fostering emotional engagement within the educational setting. Teachers can cultivate a positive and supportive environment that promotes students' emotional connection to the subject matter.

The study also identified behavioral engagement as the second strongest

predictor of students' English achievement. Behavioral engagement pertains to students' active participation in educational tasks, including fulfilling basic learning requirements such as attending classes and completing coursework. This dimension of engagement ensures that students meet the necessary expectations and actively partake in the learning journey. In the context of college English education for non-English majors, behavioral engagement becomes particularly significant. Since English is not their specialized subject, some students may exhibit behaviors that impede their progress, such as being absent from class, sleeping during lectures, or prioritizing assignments from other courses over their English coursework. These behaviors can hinder their ability to fully engage with the subject matter and negatively impact their overall English achievement (Fredericks et al., 2016). By emphasizing and promoting behavioral engagement, educators can address these challenges and help students in developing positive behaviors which are conducive to their English achievement (Wang & Fredericks, 2014). This may involve implementing strategies to enhance attendance, promoting active participation in class discussions and activities, and providing clear guidelines and expectations for completing coursework.

In this particular study focused on college English education for non-English majors in China, the findings indicated that cognitive engagement emerged as the weakest predictor of English achievement. This contrasts with other studies conducted in different contexts, such as Gunuc (2014) and Piao (2017), where cognitive engagement emerged as the most robust predictor of academic achievement. A closer examination of these studies revealed that the divergent conclusions could be attributed to disciplinary differences and the specific research contexts. The broader studies that identified cognitive engagement as a strong predictor likely examined overall education at the whole school level, while this study specifically focused on English education for non-English majors. In the context of college English education for non-English majors, students face challenges in maintaining a positive attitude (Liu & Yang, 2022) and fulfilling fundamental learning requirements, such as attendance and completing coursework (Jiang, 2021). Cognitive engagement involves active processing, critical thinking, and deep understanding of course materials. However, in situations where students struggle to establish and maintain positive attitudes and basic behaviors, their cognitive engagement may not have a significant impact on academic achievement. Limited time and resources hinder their ability to dedicate sufficient effort to the learning process.

This actual situation provides an explanation for the findings of this study, where emotional and behavioral engagement emerged as stronger predictors than cognitive engagement. Therefore, it is crucial to address and improve emotions and basic behaviors before expecting substantial gains from cognitive engagement. A student who finds enjoyment in learning usually is more motivated to tackle difficult challenges (Pekrun & Linnenbrink-Garcia, 2012). Besides, when students actively participate in learning activities, complete assignments, and interact with their peers and teachers, they are more likely to cultivate a more profound comprehension of the subject matter, enhance their

critical thinking skills, and bolster their cognitive engagement within the learning journey (Wang & Eccles, 2012). Thus, by establishing a solid foundation of emotional and behavioral engagement, students can create an environment conducive to deeper cognitive engagement, ultimately leading to enhanced academic achievement. Despite its relatively weaker predictive power, cognitive engagement still holds significance alongside the other dimensions in influencing English achievement. It highlights the significance of considering all dimensions of student engagement in shaping students' academic achievements.

As highlighted in the introduction, disengagement is prevalent across various dimensions of student engagement in the English classroom. It is crucial for teachers to recognize and address this issue by actively considering their students' engagement levels in all three dimensions. To do so, teachers need to develop an understanding of student engagement and its relationship with English achievement. When teachers observe that students are not actively engaging in the class, it becomes necessary to implement strategies that can enhance their level of engagement. However, emotional and cognitive engagement, being aspects of students' psychological energy, may not always be readily observable to teachers (Fredericks et al., 2016; Reeve & Tseng, 2011). Therefore, the researcher recommends that teachers, at the beginning of the course, provide a comprehensive overview of the three dimensions of student engagement and emphasize their significant impact on academic achievement. By doing this, teachers can encourage students to reflect on their own levels of engagement and take ownership of their learning. In order to foster high levels of student engagement and consequently improve English achievement, it is essential for teachers and students to work collaboratively. By establishing a partnership, they can jointly strive to achieve and maintain optimal levels of student engagement. This cooperative approach will contribute to creating a conducive learning environment that promotes active student participation and supports their English language development.

6. Implications

The findings of this study support and extend the application of student engagement theory to the specific context of college English education for non-English majors in China. This expansion opens up possibilities for applying the theory to other subjects and diverse educational contexts, providing valuable guidance for improving academic achievement across different disciplines.

This study also highlights the potential value of student engagement in enhancing academic achievement in college English education for non-English majors in China. By emphasizing the importance of student engagement, the study contributes to improving the quality of English education for non-English majors in Chinese universities. As a result, students' English proficiency levels are likely to improve, benefiting their personal development. Furthermore, the enhancement of English proficiency among non-English majors contributes to the cultivation of internationally competitive talents across various industries in China, thereby making a meaningful impact on society.

7. Conclusion

This study examined the relationship between student engagement and academic achievement in the context of college English education for non-English majors in China. The findings revealed significant and positive associations between student engagement dimensions (emotional, cognitive, and behavioral engagement) and academic achievements. Students who exhibit higher levels of engagement tend to achieve higher academic achievements, while those with lower levels of engagement tend to experience lower academic achievements. These dimensions collectively accounted for a substantial proportion (65.3%) of the variance in academic achievement. Emotional engagement emerged as the strongest predictor, followed by behavioral engagement and cognitive engagement. These findings highlight the importance of addressing all dimensions of student engagement to improve their academic achievements, particularly emotional and behavioral engagement. By prioritizing and promoting student engagement, educators and policymakers can enhance the quality of college English education and support students in achieving better English proficiency.

However, it some limitations in this study must be acknowledged. The research was conducted solely within the context of Hebei Province and focused on non-English major undergraduates from public universities. As such, the participants' geographical and institutional specificity might affect the applicability of the findings to wider student populations. Additionally, the study relied on self-report measures for data collection, which could introduce response bias or social desirability effects. Despite these limitations, the insights gained from this study offer valuable implications for educational practitioners, researchers, and policymakers seeking to enhance students' academic achievements through improved engagement strategies. Future research should consider these limitations and explore additional variables and contexts to further enrich our understanding of student engagement and its impact on academic success.

8. References

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Appendix I: Questionnaire of Student Engagement Scale

Part A: Demographic information
第一部分：基本信息

In this section, the researcher would like to obtain information about your background, so that she can develop demographic profiles related to the study.
在本节中，研究人员希望了解您的背景，以便了解到与研究相关的一些人口统计资料。

Please choose the appropriate options or fill in the blanks with the appropriate answers.
请选择适当的选项或用适当的答案填空。

1. **Age group (years old)/年龄区间（岁）:**
   - ○ 17-19
   - ○ 20-22
   - ○ 23-25
   - ○ Over 25/25岁以上

2. **Gender/性别:**
   - ○ Male/男性
   - ○ Female/女性

3. **Academic Year/当前学年:**
   - ○ First year/大学一年级
   - ○ Second year/大学二年级
   - ○ Third year/大学三年级
   - ○ Fourth year/大学四年级

4. **Universities/Colleges/学校 (Due to schools' policy, the name of universities/colleges is replaced with a code in here):**
   - ○ A
   - ○ B
   - ○ C
   - ○ D
   - ○ E
   - ○ F

5. **CET-4 Score/大学英语四级成绩:**

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Part B: English Learning Engagement Scale (ELES)
第二部分：英语学习参与问卷

ELES is designed specifically for non-English majors to measure their engagement in college English education. ELES has 33 items with three domains which are: (1) emotional engagement (9 items), (2) cognitive engagement (13 items), and (3) behavioral engagement (11 items), evaluated with a 5-point Likert scale ranging from 1 which is strongly disagree to 5 which is strongly agree (see the table below). Please circle the options which relate to your actual situation for each item.
英语学习参与问卷专为非英语专业学生设计，用于衡量他们对大学英语教育的参与程度。英语学习参与问卷共有33个项目，分为三个领域，分别是：（1）情感参与（9个项目），（2）认知参与（13个项目）和（3）行为参与（11个项目），使用5点Likert量表进行评估，范围从1分到5分，表示从非常不同意到非常同意（见下表）。请勾选您认为符合您实际情况的选项。

1	**2**	**3**	**4**	**5**
Strongly Disagree (SD) **非常不同意**	**Disagree (D)** **不同意**	**Somewhat Agree (SA1)** **比较同意**	**Agree (A)** **同意**	**Strongly Agree (SA2)** **非常同意**

Item No. 序号	Item 项目	SD	D	SA 1	A	SA 2
Emotional Engagement/情感参与						
EE1	I like taking the College English class. （我喜欢上大学英语课。）	1	2	3	4	5
EE2	I am full of confidence in learning college English well. （我有信心能够把大学英语学好。）	1	2	3	4	5
EE3	The College English class is a fun place to be. （大学英语课非常有趣。）	1	2	3	4	5
EE4	I feel happy when taking the College English class. (我在上大学英语课时会感到高兴。)	1	2	3	4	5
EE5_R	I feel bored with the College English class. (R) (我对大学英语课感到厌烦/无聊。) [反向]	1	2	3	4	5
EE6	I am interested in the work given to me in my College English class. (我对大学英语课上布置的学习任务感兴趣。)	1	2	3	4	5
EE7	I feel excited about the work given to me in my College English class. (我为大学英语课上布置的学习任务感到兴奋。)	1	2	3	4	5
EE8	I like my teacher in the College English class. (我喜欢大学英语课的任课教师。)	1	2	3	4	5
EE9	I like my classmates in the College English	1	2	3	4	5

	class. (我喜欢大学英语课上的同学们。)					
Cognitive Engagement/认知参与						
CE1	When I memorize words or learn knowledge points, I use a variety of methods to help me, rather than using rote memory. (当我记忆单词或学习知识点时，我会使用各种方法来帮助自己，而不是死记硬背。)	1	2	3	4	5
CE2	I try to look for some course-related information on other resources such as television, journal paper, magazines, website, WeChat official account, etc. (我会在其他资源上寻找一些与课程相关的信息来辅助学习，如电视、期刊、报纸、杂志、网站、微信公众号等。)	1	2	3	4	5
CE3	I read extra materials to learn more about things we do in the College English class. (我会阅读额外的资料来了解更多关于我们在大学英语课上所学的内容。)	1	2	3	4	5
CE4	After learning new knowledge, I think about whether it is related to the knowledge I have learned before. (学习新知识后，我会思考它是否与我以前所学的知识相关。)	1	2	3	4	5
CE5	I combine the knowledge learned in College English class with my daily life to help me understand and master it. (我会把大学英语课上学到的知识和我的日常生活结合起来，以此来帮助我理解和掌握它。)	1	2	3	4	5
CE6	After class, I review the knowledge learned in College English class and summarize the key points and difficult points. (课后，我会复习大学英语课堂上所学的知识，总结重点和难点。)	1	2	3	4	5
CE7	I check my coursework for mistakes. (我会检查我的作业是否有错误。)	1	2	3	4	5
CE8	I study after class even when I do not have a test. (即使没有考试，我也会在课后学习英语。)	1	2	3	4	5
CE9	When I read the course materials, I ask myself questions to make sure I understand what it is about. (当我阅读课程材料时，我会问自己一些问题，以确保我理解课程内容。)	1	2	3	4	5
CE10	If I do not know about a concept when I am learning in the College English class, I do something to figure it out.	1	2	3	4	5

	(如果我在大学英语课上学习时遇到不理解的概念，我会想办法来弄明白。)					
CE11	If I do not understand what I learn in the College English class, I go back to learn again. (如果我没有理解我在大学英语课上学到的知识，我会重新学习该知识。)	1	2	3	4	5
CE12	I make my own learning plan for college English and regularly check the learning progress. (我为自己制定了大学英语学习计划，并定期检查学习进度。)	1	2	3	4	5
CE13	When I encounter problems in College English learning, I think about whether my learning methods are inappropriate. (当我在大学英语学习中遇到问题时，我会思考我的学习方法是否不当。)	1	2	3	4	5
Behavioral Engagement/行为参与						
BE1	I follow the rules of the College English class. (我遵守大学英语课的纪律。)	1	2	3	4	5
BE2_R	I have trouble when taking the College English class. (R) (我在上大学英语课时遇到了麻烦。)[反向]	1	2	3	4	5
BE3_R	When I am in the College English class, I just act as if I am learning. (R) (在大学英语课堂上，我只是假装在学习。) [反向]	1	2	3	4	5
BE4	I am able to consistently pay attention when I am taking the College English class. (当我上大学英语课时，我能够始终如一地集中注意力。)	1	2	3	4	5
BE5	I complete my coursework on time. (我会按时完成我的功课。)	1	2	3	4	5
BE6	I do the coursework for College English classes carefully. (我会认真完成大学英语课的功课。)	1	2	3	4	5
BE7	After the College English class, I spend a lot of time learning English. (课后，我会花很多时间学习大学英语。)	1	2	3	4	5
BE8_R	In College English class, I study other subjects. (R) (在大学英语课上，我学习其他科目。)[反向]	1	2	3	4	5
BE9	When the teacher asks us to discuss with each other in the College English class, I actively discuss with my classmates. (在大学英语课上，当老师要求互相讨论时，我积极地与同学们讨论。)	1	2	3	4	5
BE10	In the College English class, I actively answer	1	2	3	4	5

	the questions raised by the teacher. (在大学英语课上，我积极回答老师提出的问题。)					
BE11	In College English class, I actively ask questions if there is something I do not understand. (在大学英语课上，如果有什么我不懂的，我会主动提问。)	1	2	3	4	5