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Research Article

Exploring the Impact of Academic Self-Concept on Learning Engagement: The Mediating Role of Teacher Expectations

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Abstract: Learning engagement pertains to a psychological state in which individuals uphold a sustained positive attitude, emotions, and cognitive processes while engaging in learning, research, or work activities. Academic self-concept, being a crucial factor that influences students' learning outcomes, has attracted extensive attention from scholars in the academic field. This research, with college students as the research participants, aims to explore the impact of academic self-concept on learning engagement and to examine the mediating role of teacher expectations within these relationships. A total of 280 college students participated in the questionnaire survey in this study, which involved the variables of their academic self-concept, learning engagement, and teacher expectations. Correlation analysis and mediation effect tests demonstrated a clear correlation between students' learning engagement and their academic self-concept, and teacher expectations served as a crucial mediator in the intricate relationship between academic self-concept and learning engagement. Specifically, students with a higher level of academic self-concept exhibited higher learning engagement. This study not only confirmed the importance of nurturing a positive academic self-concept among college students but also highlighted the significant impact that teachers can have on shaping students' academic self-concept. By recognizing and addressing the role of teacher expectations as a mediating factor, educators can take proactive steps to foster an environment that promotes academic self-concept and enhances learning engagement.

***Keywords*:** academic self-concept, learning engagement, teacher expectations, college students, mediating effect

1. Introduction

In the domain of higher education, the learning engagement of contemporary college students is a critical factor that exerts a profound impact on their academic achievements and personal development (Hiver, 2024). In foreign and second language classrooms, learning engagement is primarily gauged by interaction, involvement, and participation (Philp & Duchesne, 2016). As acknowledged, "indicators concern the inside features that belong to engagement, whereas facilitators are outside factors that impact the construct" (Guo et al., 2022, p. 811). With the continuous deepening of educational research, an increasing number of scholars are placing greater emphasis on the internal mechanisms that affect college students' learning engagement. Among these mechanisms, college students' academic self-concept is considered to play a vital role in this process.

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Academic self-concept refers to an individual's self-perception within the context of learning, which represents a student's prediction and judgment regarding their ability to successfully accomplish a learning task (Marsh, 2018). The construct of academic self-concept encompasses individuals' cognitive appraisal of their academic strengths and deficits, through which they form a positive regard for their capabilities and derive a sense of self-worth (Sunu & Baidoo-Anu, 2023). Individuals with a robust academic self-concept possess a steadfast belief in their capacity to navigate learning-related tasks, accompanied by a constructive cognitive appraisal of their scholastic standing. This psychological orientation is likely to engender positive academic affectations, such as intellectual gratification and scholastic joy (Rodríguez-Muñoz et al., 2021), thereby fostering sustained dedication to the pursuit of knowledge. However, research on academic self-concept remains incomplete. Key gaps include limited exploration of its domain-specific variation and there remains a significant research gap in the study of learning engagement among non-English major undergraduates. Furthermore, there is a notable scarcity of research exploring academic self-concept as an antecedent variable.

Upon leaving the highly structured and rigorous disciplinary environment of their primary and secondary school years, college students often enter a crucial stage of self-management and adaptation. In this context, educators play an essential role in the academic setting, having a long-lasting and profound impact on students' learning methods and behavioral patterns (Goetz et al., 2021). More than half a century ago, Rosenthal and Jacobson (1968) discovered that a teacher's belief in and expectation of a student's potential could lead to self-fulfilling prophecies. It is important to note that the influence of teachers' expectations is mainly manifested through students' understanding of them. Once these perceived expectations are internalized by students, they have a significant effect on their motivation and academic achievements (Johnston et al., 2024). A large number of studies have shown that teachers' expectations can significantly affect students' learning attitudes, behaviors, and academic performance. Positive teacher expectations can create a supportive learning environment for students, boost their self-confidence, and stimulate their learning motivation. For instance, when teachers have higher expectations of students, they are likely to give them more attention, encouragement, and learning opportunities, thus motivating students to put more effort into their studies. However, currently, there is a lack of sufficient research on how teachers' expectations mediate the relationship between college students' academic self-concept and their learning engagement.

In summary, while extant research has to some degree investigated the roles of college students' academic self-concept and teachers' expectations in the learning process separately (Steinberg et al., 2024; Good, 2024), the research on how these two factors jointly affect college students' learning engagement remains relatively scarce. Consequently, the current study endeavors to conduct a more in-depth exploration of the impact of college students' academic self-concept on their learning engagement and further uncover the mediating mechanism of teachers' expectations in this relationship. By doing so, it aims to offer theoretical support and practical guidance for enhancing the level of college students' learning engagement.

2. Literature review

2.1 *Academic self-concept*

The academic self-concept has its roots in the concept of self, which was initially proposed by Shavelson in 1976 (Marsh, 2008). Ever since the emergence of the self-concept notion, an increasing number of scholars have dedicated substantial efforts to exploring it from diverse perspectives. Nevertheless, scholars both at home and abroad have been engaged in continuous controversy over the definition of this theory, and no conclusive consensus has been reached yet. The concept of self refers to an individual's perception of their own identity, which is derived from their interpretation of their inner world. As research on the self-concept deepens, the academic self-concept has emerged as a distinct construct. Currently, the academic understanding of the academic self-concept encompasses cognitive, emotional, and evaluative dimensions. From a cognitive perspective, the academic self-concept pertains to an individual's self-awareness in learning contexts. It involves students' expectations and judgments regarding their ability to succeed in the learning tasks they set for themselves, as well as their reflections on academic achievements and performance (Marsh, 2018; Byrne, 1984; House, 1992). The evaluative perspective incorporates the cognitive one, considering the academic self-concept as students' perceptions and evaluations of their own learning. From an emotional stance, it is posited that the academic self-concept extends beyond cognitive assessments of one's academic capabilities, encompassing

the emotional experiences accumulated throughout the academic journey (Valentine et al., 2004). These three aspects jointly provide a multi-dimensional lens through which to examine the academic self-concept. Although originating from different perspectives, these definitions reach a common consensus: they all assert that the self-concept embodies an individual's self-evaluation. In general, individual's possessing heightened levels of academic self-concept exhibits a strong correlation with positive psychological attributes like confidence and a profound sense of competence, thereby positively forecasting students' subject interest, school performance, and academic attainment (Durik et al., 2006). Those who harbor elevated academic self-concept are inclined to embrace deep learning strategies and demonstrate robust learning engagement, whereas students with diminished levels of academic self-concept frequently grapple with academic burnout. Research underscores that academic self-concept transcends being merely an educational goal; it also exerts an influence on myriad facets, encompassing superior academic performance, heightened engagement, intrinsic motivation, alleviated test anxiety, and sustained educational accomplishments over an extended period (Guo et al., 2022).

Research on academic self-concept has witnessed substantial development, evolving from a heavy reliance on foreign studies to the conduct of localized investigations. During this process, researchers have come to recognize that academic self-concept is not merely an abstract concept but is intricately intertwined with the real-world circumstances of students (Wang & Yu, 2023; Arens & Niepel, 2023). As such, it calls for more in-depth exploration and research within the framework of local culture and education. A crucial area of inquiry has focused on the diverse factors influencing academic self-concept, which encompass both individual characteristics and environmental forces. At the individual level, factors such as age, interests, prior academic performance, and attributional styles play a significant role in shaping an individual's perception of their academic abilities. The level of academic self-concept has a profound impact on students' academic resilience. Students with a high level of academic self-concept are more likely to adopt positive coping strategies when facing learning challenges.

External factors, such as parental and societal influences, also play a significant role in shaping students' academic self-concept. Empirical research has demonstrated that nurturing parenting styles have a positive impact on students' academic self-concept (Batool, 2020). Moreover, it is widely accepted that these parenting styles can alleviate academic burnout. In the context of society, social comparison and social support exert substantial influence on students' academic self-concept. Generally, a higher level of social comparison and social support is associated with a stronger academic self-concept.

2.2 *Learning engagement*

Schaufeli et al. (2002) first introduced the concept of learning engagement, defining it as a state of physical and mental commitment demonstrated by students during learning. Research has established learning engagement as a pivotal factor influencing academic success (Xie et al., 2020), exhibiting a strong correlation with learning persistence, performance, and academic completion (Hu & Kuht, 2002). As a multifaceted construct, learning engagement has been defined differently by various learners based on different research contexts. From the perspective of learning activities, learning engagement refers to students' commitment and dedication to learning activities (Fredricks et al., 2016). Meanwhile, from the perspective of measurement methods and influencing factors, learning engagement represents the level of energy and efforts students exert during the learning process. This can be observed and measured through learners' behavioral, cognitive, and emotional indicators, and is influenced by internal and external factors such as teacher-student relationships, peer relationships, learning activities, and learning environments (Bond et al., 2020).

In terms of conceptual framework of learning engagement, Martin (2006) defined learning engagement as a two-dimensional framework including behavioral engagement and cognitive engagement. A study conducted by Fredricks et al. (2004) showed that learning engagement is a three-dimensional structural concept including behavioral engagement, cognitive engagement and affective engagement, which has been proved over time and is a widely accepted and recognized dimension. Some scholars believe that English learning engagement refers to the "state of high attention and involvement" of foreign language learners in accomplishing learning tasks (Philp & Duchesne, 2016). Subsequently, Fredricks et al. (2016) added the dimension of social engagement, which refers to a social interaction between students and peers or students and teachers. Given its complexity, there is no universally accepted definition of learning engagement. Schaufeli et al. (2002) proposed that learning engagement encompasses three dimensions: absorption, vigor, and dedication. Absorption entails students' mental resilience and positive mindset in tackling challenging

tasks. Vigor pertains to students' active bodily or mental strength. Dedication reflects students' pride and enjoyment in overcoming learning challenges.

Regarding factors influencing learning engagement, interpersonal relationships, including teacher-student, parent-child, and peer relationships, significantly impact affective engagement (Furrer & Skinner, 2003). In terms of peer relationships, there is a positive relationship between peer relationships on learning engagement, and the better the peer relationships are, the more favorable they are to promote the level of learning engagement (Furrer & Skinner, 2003). The more positive the performance of individuals is in all aspects, the higher the level of learning engagement is. Additionally, female students tend to exhibit a higher level of engagement in learning compared to male students (Langelaan et al., 2005).

Scholars have also conducted a lot of research on learning engagement. Individuals with better mental toughness tend to reduce the impact of special circumstances on learning engagement. Family factors also affect students' learning engagement, and parental educational expectations positively predict students' learning engagement, and higher parental educational expectations lead to students' enjoying higher educational investment, which in turn increases learning engagement Individuals possessing higher cultural capital exhibit elevated levels of learning engagement. Regarding schools, students' perceptions of the school climate influence their learning investment, with a positive climate fostering increased engagement.

For students of different ages, learning engagement significantly predicted their academic development and performance. For middle school or elementary school students, learning ability in learning engagement was a significant predictor of academic achievement. For high school students, students' learning engagement could well predict their academic performance. Relationship between academic performance and learning engagement is a complementary one. For instance, an increase in learning engagement enhances academic performance, which in turn further boosts engagement.

Summarizing the aforementioned literature, it is evident that the factors influencing learning engagement are multifaceted.

2.3 *Teacher expectations*

Over a long period of time, the literature on teacher expectations has been extensive, and the understanding of this topic has a deep-rooted history, tracing back even before the renowned "Pygmalion Effect" study (Rosenthal & Jacobson, 1968). Teacher expectations refer to the inferences educators make concerning their students' future conduct or academic attainment, grounded in their present comprehension of those students. Alternatively, they can be characterized as the disparity that exists between educators' aspirations for their students' performance and the actual outcomes achieved by those students on standardized evaluations (Clarke et al., 2003; Wang et al., 2018). Research has demonstrated that teachers formulate their expectations on the basis of a multitude of factors, encompassing students' academic achievements, engagement and conduct within the classroom, as well as demographic attributes such as ethnicity, gender, socioeconomic status, and the necessity for specialized educational support (Rubie-Davies et al., 2018). In recent years, educational psychology has witnessed a surge of attention focusing on the ramifications of teacher expectations on students' academic attainment (Wang et al., 2018). The beliefs and attitudes of teachers exert a profound influence on students' motivational orientations and learning paradigms. This impact becomes evident through explicit utterances, nuanced conduct, and the feedback imparted, thereby eliciting corresponding adjustments in students' learning behaviors (Rubie-Davies et al., 2020; Hornstra et al., 2023). For instance, research has indicated that a primary condition for students to establish learning motivation is the expectation they receive from teachers converted into learning motivation, which in turn promotes students' learning engagement (Hornstra et al., 2018). Furthermore, educators possessing high expectations for their students are prone to assign more stimulating assignments, offering frequent constructive feedback, and thereby directly augmenting students' academic dedication and motivation (Rubie-Davies et al., 2012). These educators incorporate a variety of options in their instructional activities, utilize teaching strategies that inspire motivation, consistently monitor students' academic advancements, and cultivate an atmosphere conducive to self-directed learning (Johnston et al., 2022). Conversely, instructors with lower expectations are more likely to rely on direct instructional methods, provide students with limited choices, offer scant feedback, and rigidly stratify students by their abilities. Such practices may lead to a decrement in students' interest in learning and a decrement in the adoption of behaviors that bolster academic achievement. In reality, the influence of teachers' behavior

on students' learning is heavily contingent on how students interpret those behaviors, which may not always coincide with the teachers' intended meanings (Johnston et al., 2024). Students adjust their academic conduct in response to the expectations they perceive from teachers, striving to meet these expectations and gain positive reinforcement.

2.4 *The mediating role of teacher expectations*

The significance of teacher expectations in enhancing students' learning has been acknowledged for a considerable time (Rubie-Davies, 2008). However, the role of teacher expectations in the relationship between academic self-concept and learning engagement has received scant attention from scholars. When reviewing and sorting out the literature, it was found that both perceived teacher expectations and academic self-concept are significantly correlated with learning engagement. However, currently, there has been no in-depth exploration of what kind of influence paths exist among the three.

Furthermore, previous research has indicated that teacher expectations exert an influence on teachers' behavior and, consequently, the performance of their students (Ready & Wright, 2011). Numerous studies have pinpointed the distinct ways in which teachers interact with students based on whether they hold high or low expectations for them (Tenenbaum & Ruck, 2007). When teachers harbor high or low expectations for their students, they convey these expectations through both verbal and non-verbal means. Students are more inclined to put in extra academic effort and become more motivated when they sense that their teachers care about them. Scholars have conducted investigations and confirmed that teachers' expectations for students can influence how students perceive themselves as learners. This study employed theoretical frameworks from educational psychology to explore students' self-perception of their academic abilities (Chen et al., 2011; Rubie-Davies, 2008). Concepts from psychological theories, such as "self-concept" and "self-expectancy," were used to structure the response framework for students, allowing their answers to be represented numerically in statistical analysis (Friedrich et al., 2015; Trusz, 2018). In an investigation exploring the relationship between teachers' expectations and children's socioeconomic backgrounds in terms of academic outcomes, the research findings indicate that, after controlling for children's ethnicity, prior academic achievement, and gender, teachers' expectations serve as a mediator between children's Socioeconomic Status (SES) and their subsequent language and mathematics academic performance (Speybroeck et al., 2012). In conclusion, teacher expectations may mediate academic self-concept and learning engagement.

2.5 *Theoretical foundations*

This study primarily builds on High Expectation Theory. The High Expectation Theory originated from the long-standing research tradition on teacher expectations (Rubie-Davies et al., 2015), which began with the study of "Pygmalion in the Classroom" by Rosenthal and Jacobson (1968). In this study, the participating teachers were informed that some of their students would achieve excellent academic results. Over time, these students did make significant progress. The High Expectation Theory emphasizes that teachers' high expectations for students can influence students' learning and development. Teachers convey high expectations to students through specific teaching behaviors, thereby creating a supportive learning environment that promotes students' motivation, participation, learning, and well-being. Teachers consistently provide students with high-level learning opportunities during the teaching process (Zohar et al., 2001), including elaborating on concepts, connecting to previous knowledge, posing advanced questions, organizing cooperative learning among students (Gillies, 2016), and allowing students to choose activities independently. This approach helps students focus on skill mastery rather than comparison of grades, enhancing academic progress, self-belief, and learning motivation. The research of Rubie-Davies (2007) found that about one-quarter of teachers are high-expectation teachers, and one-sixth are low-expectation teachers. High-expectation teachers create a warm atmosphere, establish positive relationships with students, emphasize collaboration and support among students, engage in proactive and preventive management, and turn the classroom into a supportive learning community that meets students' relational needs and enhances their sense of belonging. Teachers with high expectations place great emphasis on goal setting. All students in high-expectation classrooms have clear learning goals. Students understand what they are learning, the skills they need to master next, and how to achieve their goals. They also know how to assess their success (Clark et al., 2003). Finally, high-expectation teachers closely monitor students' progress and provide specific, frequent, and targeted feedback based on students' goals and their progress in achieving them (Rubie-Davies et al., 2015). Students are very

clear about what they need to do and learn next.

In addition, the Self-Determination Theory (SDT) provides a solid theoretical framework for this study. SDT (Deci & Ryan, 1985; Ryan & Deci, 2000a; Ryan & Deci, 2000b) is regarded as an overarching theory that encompasses motivation and well-being. Individuals internalize motivation as a natural response, either intrinsically or extrinsically. Individuals perform best when their needs for autonomy, competence, and belonging are fulfilled. "Therefore, SDT constructed a theoretical foundation for the motivation process about individual self-determination behavior, stipulating that the environment enhances the internal motivation and promotes the internalization of the external motivation by satisfying the basic psychological needs of the individual" (Pan, 2020, p. 4). Autonomy means self-determination, especially the choice and psychological freedom students enjoy in education, which affects their motivation and adaptability. The need for competence refers to the ability of an individual to succeed in the most appropriate and challenging job with the desired outcome. The need to belong refers to the security of an individual to feel respected as well as interdependent in a relationship. When an individual encounters difficulties or challenges, or when the individual's need to belong is met, the student's motivation is stimulated and the level of learning engagement increases. Self-determination theory emphasizes the role of psychological security as well as interpersonal relationships in the motivation of an individual's behavior. When an individual's psychological needs can be met by the support of the external environment, it fosters the internalization of their motivation, leading to positive behavioral outcomes. Conversely, a lack of such support can diminish students' motivation and performance. In summary, teacher expectations, as a component of the external environment, can enhance students' learning engagement when they possess a certain academic self-concept.

2.6 *Current study*

Based on the above new insights emerging from recent research on academic self-concept, teacher expectations, and learning engagement, this study proposed the following overarching research questions:

Question 1: What are the associations between academic self-concept, teacher expectations and learning engagement among Chinese non-English major undergraduate students?

Question 2: Do teacher expectations mediate this relationship?

Next, the following research hypotheses were formulated:

Hypothesis 1: Academic self-concept is positively correlated with learning engagement.

Hypothesis 2: Academic self-concept is positively correlated with teacher expectations.

Hypothesis 3: Teacher expectations are positively correlated with learning engagement.

Hypothesis 4: Teacher expectations mediate the relationship between academic self-concept and learning engagement.

The hypothesized model was shown in Figure 1.

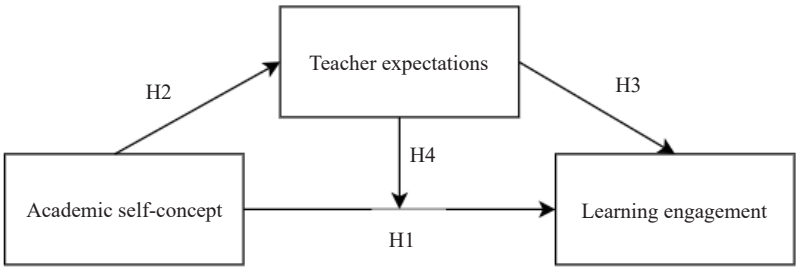

Figure 1. Hypothesized model of academic self-concept, learning engagement, and teacher expectations

3. Methodology

3.1 *Participants and research procedures*

A total of 300 non-English major undergraduate students who took college English courses from a comprehensive normal university in eastern China voluntarily participated in this survey research. The samples were randomly selected from several classes. The 300 students completed the questionnaire survey within ten minutes during their college English classes. Immediately after completion, the questionnaires were collected. To protect the privacy of the respondents, all questionnaires were administered anonymously. The following criteria were used in this study to exclude the invalid questionnaires: (1) The answer time was lower than average. (2) Questionnaires with more than a 10% omission rate of questions in core scales (e.g., Academic Self-Concept Scale, Learning Engagement Scale) were excluded. The questionnaire was distributed on-site in paper form, answered on-site, and collected on-site. A total of 300 questionnaires were distributed, excluding invalid and incomplete questionnaires, and 280 questionnaires were obtained after quality control, with an effective recovery rate of 93.33%. Of these valid 280 questionnaires, the age of the participants ranged from 18 to 24 years old. Among them, 117 (41.79%) were male and 163 (58.21%) were female.

3.2 *Instruments*

3.2.1 *Academic self-concept*

The academic self-concept scale was adapted from the Self-Description Questionnaire developed by Marsh and Parker (1984) and the Self-Concept Questionnaire by Song and Hattie (1984). The adapted scale consisted of 10 items and was assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher total score indicates a higher level of students' academic self-concept. The Cronbach's α coefficient of the academic self-concept scale was 0.9, the Kaiser-Meyer-Olkin (KMO) value was 0.891, and the result of Bartlett's sphericity test was less than 0.001, indicating that this scale exhibited good reliability and validity.

3.2.2 *Learning engagement*

This scale was adapted from the UWES-S scale developed by Schaufeli et al. (2002), aiming to measure students' learning engagement. The scale had three dimensions: vitality (e.g., "When I study, I feel energetic"), dedication (e.g., "I find learning challenging"), and absorption (e.g., "When I study, I forget everything around me"). Each item was evaluated using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher total score indicates a higher level of students' learning engagement. The Cronbach's α coefficient of the learning engagement scale was 0.911, the Kaiser-Meyer-Olkin (KMO) value was 0.928, and Bartlett's sphericity test was less than 0.001, indicating that this scale had good reliability and validity.

3.2.3 *Teacher expectations*

This scale was adapted from the measure of Dandy et al. (2015) which was referred to as the *Expectations scale*, involving 10 items using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's α coefficient of the teacher expectation scale was 0.914, the Kaiser-Meyer-Olkin (KMO) value was 0.908, and Bartlett's sphericity test was less than 0.001, indicating that this scale had good reliability and validity.

3.3 *Data analysis*

Firstly, descriptive statistics were calculated using SPSS 27.0 to determine the mean and standard deviation of the primary variables. Subsequently, Pearson correlation analysis was applied to compute correlation coefficients, examining the correlations among the main variables, thereby addressing the first research question. Mediation analysis was conducted using Process v4.1 (Model 4) in SPSS 27.0 to investigate the mediating effect of teacher expectations between academic self-concept and learning engagement, aiming to resolve the second research question.

4. Results

4.1 *Common method deviation test*

The Harman single-factor test was conducted to examine the potential for common methodological bias, given that all the data were obtained from the participants' self-reported questionnaire results. The data results indicated that the variance explained by the first factor was 40.34%, which was significantly lower than the critical value of 50% proposed by Podsakoff et al. (2003). Moreover, four factors exhibited a characteristic root greater than 1. Consequently, no serious common method bias was detected in the current study.

4.2 *Descriptive statistics and correlations*

Table 1 reported descriptive statistics and correlation matrices for variables with diagonal values of Cronbach's alpha coefficients (e.g., Academic self-concept $\alpha = 0.900$, Teacher expectations $\alpha = 0.914$, Learning engagement $\alpha = 0.911$), which satisfies reliability requirements. It also presented the means and standard deviations of the key variables. According to the classification criteria for the Likert 5-point scale proposed by Oxford and Burry-Stock (1995), a mean of 3.5 or above is considered high, a mean between 2.5 and 3.4 (exclusive) is considered medium, and a mean of 2.4 or below is considered low. Therefore, based on the descriptive statistical results, participants exhibited a relatively high level of academic self-concept (M = 3.829, SD = 0.641), had high teacher expectations (M = 3.829, SD = 0.670), and demonstrated medium levels of learning engagement (M = 3.329, SD = 0.728). Table 1 also included the Pearson correlation matrix among academic self-concept, teacher expectations, and learning engagement.

Table 1. Descriptive statistics and correlation between the study variables

Variable	Mean	SD	1	2	3
1. Academic self-concept	3.829	0.641	(0.900)		
2. Teacher expectations	3.829	0.670	0.505**	(0.914)	
3. Learning engagement	3.329	0.728	0.723**	0.537**	(0.911)

N = 280. **Correlation is significant at the 0.01 level (two-tailed). Reliabilities (Cronbach α) are shown on the diagonal in parentheses.

As shown in Table 1, there was a positive correlation between academic self-concept and learning engagement ($r = 0.723$, $p < 0.01$); both teacher expectations and learning engagement ($r = 0.537$, $p < 0.01$) and academic self-concept ($r = 0.505$, $p < 0.01$) were positively correlated, which validated Hypothesis 1, Hypothesis 2 and Hypothesis 3. These results indicated that students with higher academic self-concept and teacher expectations exhibited higher levels of learning engagement.

4.3 *The moderated mediation effect test*

PROCESS macro program (Model 4) was conducted to further identify the mediating effect of teacher expectations on the link between academic self-concept and learning engagement. With academic self-concept as the independent variable, learning engagement as the dependent variable, and teacher expectations as the mediator, a bias-corrected percentile bootstrap method was implemented to test for mediation effects on 5,000 replicated samples, and the results revealed that the hypothesized model mediation effects were remarkable (Hayes, 2017). The exact results of the mediation effect tests are shown in Table 2 and Table 3.

The results of the mediation model suggested (see Table 2) that academic self-concept totally significantly predicted learning engagement ($\beta = 0.820$, $t = 14.245$, $p < 0.001$). As both academic self-concept and teacher expectations were factored into the regression equation, both academic self-concept ($\beta = 0.688$, $t = 13.146$, $p < 0.001$) and teacher expectations ($\beta = 0.252$, $t = 5.022$, $p < 0.001$) were notable predictors of learning engagement. The

bootstrap test of mediating effects was shown in Table 3. The total effect and direct effect of academic self-concept on learning engagement and the mediating effect of teacher expectations did not include 0 (from 0.728 to 0.913) in the 95% confidence interval, indicating that teacher expectations had a mediating effect between academic self-concept and learning engagement; moreover, the value of the mediating effect was 0.133, and the percentage of the mediating effect was 15.85%. Figure 2 showed the mediation model, which contained the coefficient values for each relationship between the variables. Thus, teacher expectations mediated academic self-concept and learning engagement, and Hypothesis 4 was confirmed.

Table 2. The moderated mediation effect test

Variable	Equation 1		Equation 2		Equation 3	
	β	t	β	t	β	t
Academic self-concept	0.820	14.245***	0.527	9.754***	0.688	13.146***
Teacher expectations					0.252	5.022***
R^2	0.522		0.255		0.562	
F	303.622***		95.132***		177.642***	

(1) Each variable in the model was standardized and brought into the regression equation.
(2) Equation 1: academic self-concept predicts learning engagement; Equation 2: academic self-concept predicts teacher expectations; Equation 3: academic self-concept and teacher expectations jointly predict learning engagement. ***p < 0.001.

Table 3. Analysis of the mediating effect of teacher expectations

	Effect size	SE	95% CI	Ratio total effect
Total effect	0.820	0.471	[0.728, 0.913]	
Direct effect	0.688	0.523	[0.585, 0.791]	
Indirect effect	0.133	0.292	[0.070, 0.209]	15.85%

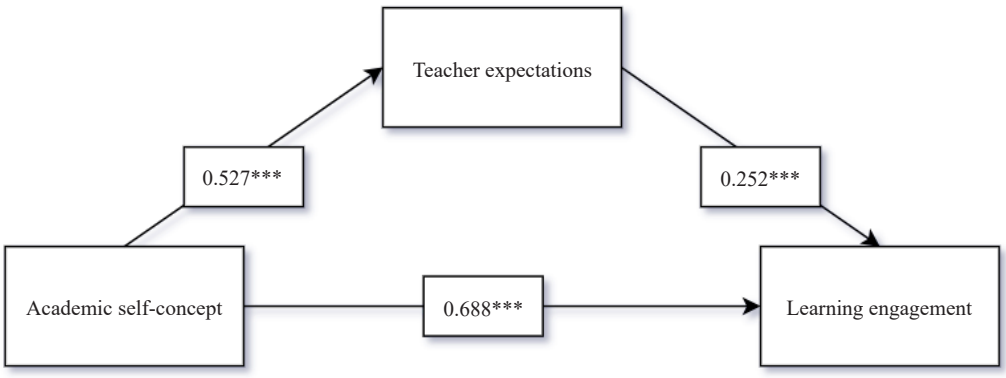

Figure 2. The moderated mediation effect test, ***p < 0.001

5. Discussion

5.1 *Core findings and theoretical validation*

The primary objective of this study was to examine the correlations among academic self-concept, learning engagement, and teacher expectations of Chinese university undergraduate students. The results of the Pearson correlation test indicated that, firstly, there was a direct and substantial correlation between academic self-concept and learning engagement. Secondly, teacher expectations were significantly and positively correlated with both academic self-concept and learning engagement, thus confirming Hypotheses 1 and 2.

Regarding the explicit connection between academic self-concept and learning engagement, this finding is in line with the results obtained from Riffert et al. (2021) who found a significant correlation between self-concept and learning engagement in their study as well. This study yields more specific conclusions, confirming the relationship between college students' academic self-concept and learning engagement. Notably, this result also aligns with the outcomes of Marsh et al. (2018), who delved into specific subject areas and argued that there was a strong correlation between students' academic self-concept in a particular subject and their academic achievement in that subject. This study goes a step further by focusing on non-English major students, confirming the predictive role of academic self-concept in learning engagement.

As for the secondary purpose, this study discovered that teacher expectations served as a mediator in the relationship between academic self-concept and learning engagement, indicating that academic self-concept not only significantly directly predicts learning engagement but also exerts influence through teacher expectations indirectly. This demonstrated that academic self-concept and teacher expectations are pivotal antecedent variables for learning engagement. Serving as both internal and external influences, respectively, they exert an impact on learning engagement, aligning with the ecological systems theory. This theory posits that human development is shaped by both internal psychological factors and external conditions (Rosa & Tudge, 2013). Learning engagement is a behavioral attitude that is influenced by the school environment and school teachers (Wong & Liem, 2022). Additionally, this finding underscores the crucial role of teacher expectations, as a key variable within expectancy theory, in influencing learning engagement. Research has demonstrated that positive relationships with teachers enhance students' motivation, involvement, and overall academic performance (Krane et al., 2016). Hence, the research findings herein provide an insightful explanation of how teachers' expectations exert an influence on students' academic performance through mediation. Teacher expectation for students' academic accomplishments can be subtly imparted to them and may have connections with facets that extend beyond those discussed in prior research (Rubie-Davies & Hattie, 2024). It is not merely the students' academic self-concept, self-worth, beliefs in their own competence, or their individuality that are shaped by their teachers' expectations; rather, their perceptions of their rapport with teachers and the level of care teachers exhibit towards them are equally impacted.

5.2 *Limitations and future research directions*

Despite adopting rigorous research procedures, the results of this study still present four major limitations. Firstly, the respondents of this study were exclusively from a single university in China. Secondly, in terms of research methodology, this study employed a cross-sectional quantitative approach, which may give rise to potential biases. Thirdly, this study did not yet examine the differences in the main study variables across gender and age, which could be verified in future research. Finally, the study only explored the single mediating role of teacher expectations, without considering the chain effects of multiple mediating mechanisms (such as self-efficacy, growth mindset, etc.).

Therefore, when extrapolating the conclusions to other countries, one should exercise caution, and future research should endeavor to increase the sample size and broaden the scope of investigation. It is advisable for future research to consider adopting a longitudinal perspective for more comprehensive results and to use mixed research combining both quantitative and qualitative methods. On the basis of quantitative analysis, qualitative interviews (such as in-depth interviews with 20 students with high/low self-concept) should be added to reveal the specific behavioral cues of teacher expectations transmission, such as teachers' non-verbal feedback and task allocation differences. Additionally, future research could also explore the chain mediation effects between academic self-concept and learning engagement.

6. Conclusion

The current study aims to explore the relationships among academic self-concept, teacher expectations, and learning engagement. Pearson correlation analysis and PROCESS mediation effect testing have confirmed the hypothesis of this study, thereby highlighting a significant positive correlation between academic self-concept and learning engagement as well as the mediating role of teacher expectations. The study also found a significant positive correlation between teacher expectations and both academic self-concept and learning engagement. Furthermore, teacher expectations partially mediate the relationship between academic self-concept and learning engagement. Therefore, it is reasonable to infer that students who have higher levels of academic self-concept and who receive higher teacher expectations during the learning process demonstrate higher levels of learning engagement. This seems to provide some insights for teaching practices. First and foremost, teachers must recognize the necessity for change. To achieve this, they should be provided with information that elucidates how teachers' expectations influence their behavior towards students, which in turn affects students' academic performance, as well as the existence of teacher expectation bias. When teachers express interest and respect for students in their interactions, they convey their expectations to the students. Not only does students' self-concept, self-esteem, self-efficacy, or sense of self get shaped by teachers' expectations, but also their perception of their relationship with teachers and the extent to which teachers care for them is influenced. Teachers can learn how to generate positive expectancy effect strategies by building relationships with students. For instance, teachers can strive to spend time talking with students, inquiring about their well-being, listening attentively to their responses, and demonstrating interest beyond their role as "students". In addition, teachers' sense of humor and their planning of innovative and entertaining activities (Dewaele et al., 2018; Li et al., 2021) can stimulate students' interest in learning and promote positive emotions among them (Fredrickson, 2001). Teachers' care elicits reactions and actions from students, motivating them to reciprocate. In return for the teachers' care, students take on the role of "the cared-for" in the relationship, acknowledging the teachers' concern and reciprocating with interest and respect towards the teachers and their learning.

Conflict of interest

The authors declare no conflict of interest.

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