

The Relationship between High School Students' Psychological Capital and Learning Engagement: An Empirical Analysis Based on Dimensional Deconstruction

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Abstract: This study aims to explore the relationship between high school students' psychological capital and its four sub-dimensions (self-efficacy, hope, resilience, and optimism) with learning engagement and its three sub-dimensions (vigor, dedication, and absorption). A questionnaire survey was conducted with 55 high school students from an international school in Beijing, using the Positive Psychological Capital Questionnaire (PPQ) and the Utrecht Work Engagement Scale—Student Version (UWES-S). The results showed that the total score of psychological capital was significantly and positively correlated with the total score of learning engagement ($r = 0.561$, $p < 0.01$). At the sub-dimension level, self-efficacy and hope had significant predictive effects on all dimensions of learning engagement, with self-efficacy being the strongest predictor. Optimism showed a weak predictive effect only on vigor and dedication, while resilience did not have a significant predictive effect on learning engagement. The study also found that both psychological capital and learning engagement tended to decline with grade level. These findings reveal the differentiated effects of psychological capital dimensions on high school students' learning engagement and provide direction and insight for future research on targeted psychological support programs for high school students.

1. Introduction

With increasing social competition and rising academic pressure, the quality of learning and the mental health of high school students have become a major focus in the field of education. Learning engagement is an important indicator for measuring students' academic development and psychological status. It reflects the level of energy, emotions, and attention students put into the learning process. Schaufeli et al. (2002) proposed a three-dimensional model of learning engagement (vigor, dedication, and absorption), which emphasizes that learning engagement represents a comprehensive state of energy, value recognition, and cognitive immersion during learning. Maintaining this state is directly related to students' academic achievement. A large number of studies have confirmed that high levels of learning engagement are closely linked to academic performance, learning satisfaction, and well-being[5] (Fredricks et al., 2004). Therefore,

exploring the psychological factors that influence learning engagement is of great importance for understanding and promoting the academic development of high school students.

According to previous research, factors influencing learning engagement are usually divided into two categories: environmental factors and individual factors. Among the individual factors, demographic variables (such as gender and age) and personal characteristics (such as IQ and personality) have received the most attention, but these are difficult to change or develop. With the rise of research on positive psychology and positive organizational behavior, psychological capital has drawn wide attention as a developable, measurable, performance-oriented, state-like variable of positive organizational behavior (Jafri, 2013). Psychological capital, as a core concept in positive psychology, is defined as a positive psychological state that can be developed during one's growth. It includes four dimensions: self-efficacy, hope, resilience, and optimism (Luthans et al., 2007). Empirical studies have shown that psychological capital can promote academic and work performance among college students and employees [17] (Luthans et al., 2010; Martínez et al., 2019). It can also provide psychological resources when facing stress, helping individuals maintain a positive state of learning and life[23] (Siu et al., 2013).

Most previous studies have focused on college students (e.g., Gong et al., 2018; Siu, 2013), with some research conducted among middle school students[30] (e.g., Zhou, 2022). However, research on high school students as a unique group remains very limited. High school students are at a critical stage of physical and mental development, face heavy academic pressure, and have underdeveloped emotional regulation abilities. The mechanisms through which psychological capital influences learning engagement may be distinctive in this group. Based on Conservation of Resources Theory (Hobfoll, 2002) and Hope Theory (Snyder, 2002), it can be assumed that the psychological resources provided by psychological capital may enhance students' vigor, dedication, and absorption in learning, thus improving their overall level of learning engagement. [8] Therefore, this study focuses on high school students, aiming to systematically examine the relationship between psychological capital and learning engagement, and further explore the corresponding relationships and predictive effects of their sub-dimensions. For example, Liu (2016) found that among college students, self-efficacy and hope made greater contributions to learning engagement compared with resilience and optimism. [11] However, whether this conclusion also applies to high school students remains to be tested. Tang (2019) also pointed out that the role of psychological capital may vary depending on the educational stage, highlighting the necessity of conducting research on the sub-dimension level in high school.

Based on this, this study surveyed 60 high school students from the same school through questionnaires to examine the relationships between the total score and four dimensions of psychological capital and the three dimensions of learning engagement. The aim is to clarify the differentiated effects and predictive power of each dimension, thereby filling the gap in existing research that has paid insufficient attention to this high-pressure group.

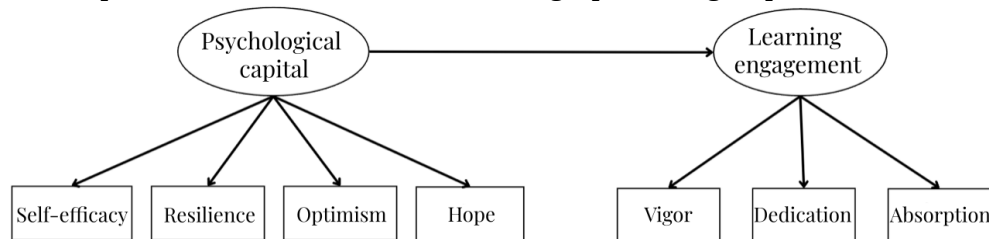


Figure 1 Model

Based on the above literature and theories, this study proposes the following hypotheses (as Figure 1 shown):

H1: The total score and sub-dimensions of psychological capital are significantly and positively correlated with the total score and sub-dimensions of learning engagement.

H2: The four sub-dimensions of psychological capital have predictive effects on the three sub-dimensions of learning engagement.

2. Literature Review

2.1 The Theoretical Development of Psychological Capital

With the rise of positive psychology, psychological capital (PsyCap), as a developable and measurable state-like variable, has provided a new perspective for explaining differences in learning engagement [9] (Jafri, 2013). Luthans et al. (2007) defined psychological capital as "a positive psychological state of development characterized by being open to growth,"[16] which includes four dimensions: self-efficacy, hope, resilience, and optimism. It goes beyond human capital and social capital and is directly linked to individual performance. In higher education, empirical studies have shown that psychological capital significantly improves both students' learning performance [12] (Luthans et al., 2012) and their level of learning engagement (Siu et al., 2013).

The theoretical foundation of psychological capital comes from positive organizational behavior (POB), and its conceptualization has gradually migrated across domains—from worker performance to student development. Luthans and Youssef-Morgan (2017) systematically explained its developmental trajectory: early studies focused on corporate employees and confirmed that psychological capital, through enhancing hope, efficacy, resilience, and optimism (the "HERO" structure), significantly improved job performance (Luthans et al., 2007). A key breakthrough at this stage was the identification of psychological capital as a state-like quality: it is neither a stable personality trait nor a fleeting emotion, but something that can be strengthened through targeted interventions such as goal-setting training and cognitive restructuring[13] (Luthans et al., 2010). Its sub-dimensions exert differentiated effects:

(1) Self-efficacy: "An individual's general belief in their own abilities, serving as intrinsic motivation to effectively complete tasks." [1] Individuals with high self-efficacy know how to boost their own motivation and are able to push themselves to overcome obstacles [3] (Cavus & Gokcen, 2015).

(2) Resilience: "The capacity to quickly recover from adversity and even grow from it." Luthans et al. (2006) described psychological resilience as a coping skill in uncertain, negative, or obstructive situations. Resilient individuals can learn from setbacks. Resilience also integrates components of self-efficacy, hope, and optimism. [14]

(3) Hope: "A motivational state formed by the interaction of agency (the determination to pursue goals) and pathways (plans to reach those goals)." Hope provides individuals with the inner willpower to commit their energy (Snyder et al., 1991).

(4) Optimism: "A thinking pattern that attributes outcomes to positive causes." Carver et al. (2010) emphasized that optimists differ in how they approach problems and challenges, as well as in how they cope with adversity and achieve success. [2]

As the theory matured, research on psychological capital expanded from organizational contexts to educational settings, proving to be equally effective in improving performance. Hobfoll's (2002) Conservation of Resources Theory highlights that individuals cope with demands by accumulating resources such as psychological capital. For students, academic challenges call for such psychological resource reserves. Luthans et al. (2012) were among the first to test its applicability in education and found that students' psychological capital improved academic performance through three pathways: (1) directly increasing persistence in learning (self-efficacy), (2) strengthening goal commitment (hope), and (3) buffering against frustration and exhaustion (resilience).

In recent years, studies on psychological capital have become more refined. Using mixed methods, researchers deconstructed the four dimensions of psychological capital and their differentiated effects on nine sub-components of learning engagement (a model different from the three-dimensional framework of Schaufeli used in this study). Findings showed that self-efficacy significantly predicted behavioral engagement (e.g., challenging academic participation, $\beta = 0.244$), hope was the strongest predictor of cognitive engagement (e.g., academic strategies, $\beta = 0.418$), while optimism even had a negative effect in some contexts (e.g., participation in social activities, $\beta = -0.145$), suggesting the risk of "blind optimism weakening reflective motivation" [18] (Mu & Huang, 2025). This finding highlights a core proposition of psychological capital theory: resource accumulation must match the developmental context. For example, under the heavy academic pressure and emotional fluctuations of high school, resilience resources may play a greater role in maintaining vigor compared with college students (Tang, 2019). At present, research on psychological capital is shifting from a "general advantage" approach to more group-specific interventions, offering evidence-based guidance for educational practice.

2.2 Current Research on Learning Engagement

The concept of learning engagement originates from the cross-domain transfer of research on work engagement. Kahn (1990) defined work engagement as "the dynamic process through which individuals integrate themselves with their work roles." [10] Highly engaged individuals actively devote energy and present themselves through their work, while those with low engagement tend to withdraw from their roles to avoid performance pressure. Schaufeli et al. (2002) extended this concept to the educational field, forming the core definition of learning engagement: a positive psychological state related to the learning process, characterized by three dimensions—vigor, dedication, and absorption. Specifically, vigor refers to students' energy and persistence when facing learning challenges; dedication reflects their sense of meaning, enthusiasm (emotional involvement), and value recognition in learning, expressed as a mission-driven sense of purpose; absorption represents being fully concentrated in learning without being easily distracted.[21] Together, these three dimensions constitute the psychological core of learning engagement (Schaufeli & Bakker, 2004).

Learning engagement and learning burnout are theoretically opposite, but the former holds greater practical significance. Research has shown that students with high learning engagement not only display stronger academic pride but also achieve greater improvements in ability and GPA performance (Schaufeli et al., 2002). Yue (2020) pointed out that learning engagement, as a key manifestation of knowledge acquisition, directly and positively affects academic achievement and has become a central indicator for evaluating educational quality and student development. [28] The National Survey of Student Engagement (NSSE) launched by Indiana University further confirmed that measuring learning engagement can effectively reflect students' academic involvement and provide precise guidance for educational interventions.

In recent years, studies have focused on the influencing factors and mechanisms of learning engagement. Siu et al. (2013) found that self-efficacy, hope, and positive attribution tendencies significantly and positively predicted levels of learning engagement. [22] Gong et al. (2018) further demonstrated through longitudinal research that learning engagement plays a mediating role between psychological resources and academic achievement. It is worth noting that characteristics of learning engagement differ across groups: high school students, facing heavy pressure from entrance exams, are more easily influenced by immediate psychological states, while college students tend to show a more stable engagement pattern (Tang, 2019).

2.3 The Mechanism Linking Psychological Capital and Learning Engagement

The relationship between psychological capital and learning engagement can be systematically explained through the Conservation of Resources (COR) Theory and the Broaden-and-Build Model. COR theory suggests that individuals have an instinctive tendency to accumulate and protect resources. As a core psychological resource, psychological capital helps maintain positive behavioral patterns by reducing resource loss and improving resource replenishment efficiency (Hobfoll, 2002). When students face academic challenges, psychological capital provides sustained energy for learning engagement by buffering stress-related depletion (resilience) and optimizing resource allocation (hope). Meanwhile, Fredrickson's (2001) Broaden-and-Build Model emphasizes that positive psychological states (such as optimism and self-efficacy) broaden individuals' cognitive and behavioral repertoires and promote spiral resource growth. Students with higher psychological capital are more likely to strengthen engagement behaviors through positive learning experiences, forming a virtuous cycle of "psychological capital → learning engagement → resource accumulation." [4]

In addition, motivational pathways serve as the key transmission mechanism between the two. Bandura's (1997) self-efficacy theory points out that strong self-efficacy enhances goal commitment and drives sustained engagement, enabling students to maintain their efforts even in the face of difficulties. Snyder's (2002) hope theory further complements this by highlighting a dual regulation mechanism of "goals–pathways": hope not only strengthens the willpower (agency) to achieve goals but also allows flexible adjustment of strategies (pathways) to overcome learning obstacles. Together, these mechanisms constitute the fundamental motivational system through which psychological capital influences learning engagement.

3. Participants and Methods

3.1 Participants

The participants of this study were Chinese high school students from an international school in Beijing. To ensure the representativeness of the sample and the feasibility of the study, a cluster sampling method was used to select 60 students as the initial research group. After data collection, invalid questionnaires—such as those with missing information or irregular response patterns—were excluded. In the end, 55 valid questionnaires were obtained, with a validity rate of 91.67%.

From the demographic characteristics of the valid sample, 17 were male (30.91%) and 38 were female (69.09%). Regarding grade distribution, 8 students were in Grade 9, 36 students in Grade 10, and 16 students in Grade 11.

3.2 Research Instruments

This study used online standardized questionnaires to measure the participants' psychological capital and learning engagement. All questionnaires had undergone strict reliability and validity testing and were suitable for the target population.

(1) Psychological capital was measured using the Positive Psychological Capital Questionnaire (PPQ), developed by Zhang et al. (2010), [29] which has demonstrated good reliability and validity. The questionnaire contains 26 items across four dimensions: self-efficacy (7 items), resilience (7 items), hope (6 items), and optimism (6 items). Each item was rated on a 7-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Items 8, 10, 12, 14, and 25 were reverse-coded. Higher scores indicated a higher level of psychological capital in the corresponding dimension. The total score, calculated as the sum of all items, represented the overall level of

psychological capital, with higher scores indicating higher levels.

(2) Learning engagement was measured using the Utrecht Work Engagement Scale—Student Version (UWES-S), originally developed by Schaufeli et al. (2002) and later revised by Fang et al. (2008) for better applicability to Chinese students. The scale includes 17 items divided into three dimensions: vigor (6 items), dedication (5 items), and absorption (6 items). Each item was rated on a 7-point Likert scale, ranging from 1 ("never") to 7 ("always").[6] Higher scores indicated a higher level of learning engagement in the corresponding dimension.

3.3 Research Methods

3.3.1 Research Design

This study adopted a cross-sectional survey design. The aim was to examine the relationship between high school students' psychological capital and learning engagement; therefore, structured scales were selected and data were collected in a single wave. The questionnaires were created and distributed through Microsoft Forms, with all items being closed-ended questions to ensure quantifiability and anonymity.

3.3.2 Implementation Procedure

This study used the snowball sampling method. A small number of eligible high school students were first invited to participate, and they were then asked to share the questionnaire link with their peers. This approach expanded the sample while maintaining a degree of randomness. The survey was conducted two weeks before the end of the semester, a period when students' academic pressure levels were relatively similar, which helped reduce the impact of external pressure differences on the results.

All participants completed the questionnaire individually online, avoiding peer influence during group participation. The instructions clearly stated that the survey was anonymous and no personally identifiable information would be recorded. This both protected participants' privacy and reduced social desirability bias. Questionnaires were distributed and collected via Microsoft Forms (design page sample link: https://forms.office.com/Pages/DesignPageV2.aspx?prevorigin=errp&origin=NeoPortalPage&rpring=Business&rpsession=a1e68a20-26d2-40ef-abe3-38de6884890d&subpage=design&id=_ZA9iCIIfM0u67zTIjyNaHRoF3aNujwxGkvfquqnv-IhUN1kzM0FKMUVTzdORFVMSjJDR0NCT01QVi4u). All students completed the questionnaire on their personal devices, and the average completion time was about 10–15 minutes, ensuring that answers were given under similar external conditions and psychological stress levels.

3.3.3 Questionnaire Structure

Part One: Demographic Information

We collected gender and grade, used to describe sample characteristics and for subsequent control variable analysis.

Part Two: Psychological Capital Scale

We adopted the Chinese version of the Positive Psychological Capital Questionnaire (PPQ), with 26 items.

Items were divided into four sub-dimensions (self-efficacy, hope, resilience, and optimism), each scored separately.

Part Three: Learning Engagement Scale

We adopted the revised student version of the Utrecht Work Engagement Scale with 17 items.

Based on Schaufeli et al.'s (2002) three-dimensional model (vigor, dedication, and absorption),

the items were divided into three sub-dimensions. [20]

The order of items was fixed according to the above three parts to minimise measurement bias caused by order effects.

3.4 Statistical Analysis

This study used SPSS 31.0 statistical software to organize and analyze the collected data. The specific statistical methods were as follows:

(1) Reliability Analysis: The internal consistency reliability of the two scales was tested by calculating Cronbach's α coefficient to ensure the reliability of the measurement instruments.

(2) Descriptive Statistics: Descriptive statistics were conducted to present the overall levels and distribution characteristics of psychological capital and learning engagement. Independent-samples t-tests were also performed for gender and age variables.

(3) Correlation Analysis: Pearson correlation analysis was used to examine the relationships between psychological capital (and its sub-dimensions) and learning engagement (and its sub-dimensions), identifying whether significant correlations existed as well as their direction and strength.

(4) Multiple Regression Analysis: Multiple regression was conducted with the total score and sub-dimensions of psychological capital as predictor variables and the total score of learning engagement as the dependent variable. This analysis assessed the predictive effects of psychological capital and its sub-dimensions on learning engagement and identified which dimensions had stronger predictive power.

4. Results

4.1 Reliability Analysis

First, reliability analyses were conducted on the two scales, and the results are shown in Table 1.

The Cronbach's α coefficients for both the Psychological Capital Questionnaire and the Learning Engagement Scale reached a satisfactory level of above 0.90. The α coefficients of each sub-dimension and the total scales were all higher than the acceptable threshold of 0.70, indicating that the questionnaires used in this study demonstrated good internal consistency reliability.

Table 1 Reliability Analysis of Psychological Capital and Learning Engagement Scales

	N	Cronbach's α	Factor	Cronbach's α
Psychological Capital (PPQ)	55	0.91	Self-efficacy	0.917
			Resilience	0.797
			Hope	0.857
			Optimism	0.813
Learning Engagement (UWES-S)	55	0.96	Vigor	0.902
			Dedication	0.856
			Absorption	0.945

4.2 Descriptive Statistics

The minimum, maximum, mean (M), and standard deviation (SD) of the total scores and subscale scores of all participants are shown in Table 2.

Table 2 Descriptive Statistics of Psychological Capital and Its Sub-dimensions, and Learning Engagement and Its Sub-dimension

Scale / Dimension	Min	Max	Mean (M)	Standard Deviation (SD)
Psychological Capital (total)	43	155	118.42	23.082
Self-efficacy	7	49	33.25	8.501
Resilience	7	48	29.13	8.032
Hope	6	42	29.18	7.183
Optimism	6	40	26.85	6.889
Learning Engagement (total)	20	117	75.35	21.515
Vigor	6	42	25.24	7.993
Dedication	5	34	24.18	6.189
Absorption	6	42	25.93	9.195

Note: N = 55 valid cases

For psychological capital, the average total score was 118.42 (SD = 23.08). Following Zhang et al. (2010), a score above 110 can be considered medium-to-high, suggesting that students at this international school generally possess a relatively positive base of psychological resources. Among the four sub-dimensions, self-efficacy had the highest mean score (M = 33.25, SD = 8.50), with an item mean of 5.54 (on a 7-point scale, >5.42 is considered high), placing it in the high-level range. Both hope (M = 29.18, SD = 7.18) and resilience (M = 29.13, SD = 8.03) had item means of 4.86, reaching a medium-to-high level. Optimism scored the lowest (M = 26.85, SD = 6.89), falling short of the medium-to-high threshold.

For learning engagement, the average total score was 75.35 (SD = 21.52). According to UWES-S norms (item mean >4.0 indicates medium-to-high level), students as a whole were at a medium-to-high level, reflecting a generally positive learning state. Among the three sub-dimensions, dedication showed the highest item mean of 4.84 (M = 25.93, SD = 9.20), reaching the high level and suggesting strong enthusiasm and sense of meaning toward learning tasks. Vigor (M = 25.24, SD = 7.99) and absorption (M = 25.93, SD = 9.20) had item means of 4.32 and 4.21, respectively, indicating medium levels and suggesting room for improvement in energy investment and sustained concentration in learning.

4.3 Demographic Variables

We used independent-samples t-tests (William Sealy Gosset) and ANOVA (Ronald A. Fisher) to examine whether there were significant differences across demographic variables.

4.3.1 Gender Differences

Independent-samples t-tests were conducted to explore gender differences in psychological capital and learning engagement. The results are shown in Table 3.

The t-test results indicated no significant gender differences ($p > 0.05$) in total psychological capital, its four sub-dimensions, total learning engagement, or its three sub-dimensions. However, the mean scores for male students were slightly higher than those for female students across all dimensions. For example, in total psychological capital, the mean for males was 125.75 compared with 115.41 for females; in self-efficacy, males averaged 34.94 versus 32.56 for females; and in the dedication dimension of learning engagement, males scored 24.69 compared with 23.97 for females.

Table 3 Independent-Samples t-Test for Gender

	Gender	N	Mean (M)	Standard Deviation (SD)
Psychological Capital (total)	Male	16	125.75	20.401
	Female	39	115.41	23.683
Self-efficacy	Male	16	34.94	7.307
	Female	39	32.56	8.941
Resilience	Male	16	32.38	5.729
	Female	39	27.79	8.541
Hope	Male	16	30.63	7.623
	Female	39	28.59	7.010
Optimism	Male	16	27.81	6.134
	Female	39	26.46	7.214
Learning Engagement (total)	Male	16	79.13	16.008
	Female	39	73.79	23.413
Vigor	Male	16	26.13	7.839
	Female	39	24.87	8.128
Dedication	Male	16	24.69	4.527
	Female	39	23.97	6.796
Absorption	Male	16	28.31	5.907
	Female	39	24.95	10.149

4.3.2 Grade Differences

A one-way ANOVA was conducted to test differences in psychological capital and learning engagement across grade levels. The results are shown in Table 4.

Table 4 Descriptive Statistics of Psychological Capital and Learning Engagement across Grades (N / M / SD)

Variable	Grade 9 (N / M / SD)	Grade 10 (N / M / SD)	Grade 11 (N / M / SD)
Psychological Capital (total)	6 / 129.00 / 16.075	35 / 119.31 / 22.771	14 / 111.64 / 25.578
Self-efficacy	6 / 33.17 / 6.765	35 / 33.57 / 8.538	14 / 32.50 / 9.541
Resilience	6 / 33.50 / 8.983	35 / 29.17 / 7.812	14 / 27.14 / 8.018
Hope	6 / 32.67 / 3.615	35 / 29.71 / 7.044	14 / 26.36 / 8.035
Optimism	6 / 29.67 / 6.408	35 / 26.86 / 6.513	14 / 25.64 / 8.073
Learning Engagement (total)	6 / 79.17 / 15.329	35 / 74.74 / 22.934	14 / 75.21 / 21.192
Vigor	6 / 27.17 / 4.355	35 / 24.80 / 8.911	14 / 25.50 / 6.937
Dedication	6 / 25.33 / 3.141	35 / 24.14 / 6.054	14 / 23.79 / 7.658
Absorption	6 / 26.67 / 9.993	35 / 25.80 / 9.842	14 / 25.93 / 7.691

Note: Values are presented as N / M (two decimals) / SD (three decimals).

From the descriptive statistics by grade (Table 4), the mean scores of psychological capital and learning engagement generally showed a decreasing trend: Grade 9 > Grade 10 > Grade 11. For example, the average total psychological capital score was 129.00 for Grade 9 (N = 6), 119.31 for Grade 10 (N = 35), and 111.64 for Grade 11 (N = 14). Among the sub-dimensions, self-efficacy showed little variation across grades (Grade 9: M = 33.17; Grade 10: M = 33.57; Grade 11: M = 32.50), while resilience, hope, and optimism all declined noticeably with grade level, with hope showing the largest drop (from M = 32.67 in Grade 9 to M = 26.36 in Grade 11).

For learning engagement, the total score followed a similar trend, with Grade 9 students scoring

the highest ($M = 79.17$, $SD = 15.33$), while Grade 10 ($M = 74.74$) and Grade 11 ($M = 75.21$) students had similar but lower averages. At the sub-dimension level, vigor was highest in Grade 9 ($M = 27.17$), dipped in Grade 10 ($M = 24.80$), and slightly recovered in Grade 11 ($M = 25.50$). Dedication gradually declined across grades (Grade 9: $M = 25.33$; Grade 11: $M = 23.79$), while absorption remained relatively stable (Grade 9: $M = 26.67$; Grade 10: $M = 25.80$; Grade 11: $M = 25.93$).

Overall, these results suggest that both psychological capital and learning engagement levels tend to decrease with grade level, particularly in the resilience, hope, and optimism dimensions of psychological capital.

4.4 Correlation Analysis

The correlation coefficients among the study variables are presented in Table 5.

Table 5 Pearson Correlation Matrix of Psychological Capital and Learning Engagement

	1	2	3	4	5	6	7	8	9
1 Psychological Capital (total)	1								
2 Self-efficacy	0.835**	1							
3 Resilience	0.613**	0.286*	1						
4 Hope	0.807**	0.686**	0.226	1					
5 Optimism	0.764**	0.514**	0.300*	0.552**	1				
6 Learning Engagement (total)	0.561**	0.635**	0.112	0.613**	0.328*	1			
7 Vigor	0.554**	0.603**	0.158	0.587**	0.316*	0.920**	1		
8 Dedication	0.595**	0.662**	0.070	0.634**	0.434**	0.889**	0.733**	1	
9 Absorption	0.432**	0.517**	0.077	0.469**	0.200	0.942**	0.789**	0.770**	1

*Note: * $p < 0.05$, ** $p < 0.01$ (two-tailed), significant correlations.

The correlation results in Table 5 show that the total score of psychological capital was significantly and positively correlated with the total score of learning engagement ($r = 0.561$, $p < 0.01$), providing preliminary support for Hypothesis 1 at the total score level.

At the sub-dimension level:

Self-efficacy showed significant strong correlations with all three sub-dimensions of learning engagement: vigor ($r = 0.603$, $p < 0.01$), dedication ($r = 0.662$, $p < 0.01$), and absorption ($r = 0.517$, $p < 0.01$). Among these, the correlation with dedication was the strongest. This aligns with the theoretical expectation that self-efficacy drives individuals to invest more effort in learning tasks, providing strong support for Hypothesis 1.

Hope was also strongly correlated with vigor ($r = 0.587$, $p < 0.01$) and dedication ($r = 0.634$, $p < 0.01$), and moderately correlated with absorption ($r = 0.469$, $p < 0.01$).

Resilience showed no significant correlations with any dimension of learning engagement ($p > 0.05$).

Optimism was weakly but significantly correlated with vigor ($r = 0.316$, $p < 0.05$) and dedication ($r = 0.434$, $p < 0.01$), but not significantly correlated with absorption.

In summary, the total score of psychological capital and certain sub-dimensions (self-efficacy and hope) were significantly and positively correlated with learning engagement and its sub-dimensions, while resilience and optimism did not consistently show significant associations. Thus, Hypothesis 1 was partially supported.

4.5 Linear Regression Analysis

Multiple linear regression analyses were conducted with the three dimensions of learning engagement (vigor, dedication, and absorption) as dependent variables, and the four dimensions of psychological capital (self-efficacy, resilience, hope, and optimism) as predictors. The results are shown in Table 6.

Table 6 Regression Models of Psychological Capital Dimensions Predicting Learning Engagement (N = 55)

Dependent Variable	Predictor	R ²	β	*t*	*p*
Vigor ←	Self-efficacy	0.363	0.603	5.500	<0.001
	Resilience	0.025	0.158	1.164	0.250
	Hope	0.344	0.587	5.277	<0.001
	Optimism	0.100	0.316	2.428	0.019
Dedication ←	Self-efficacy	0.438	0.662	6.423	<0.001
	Resilience	0.005	0.070	0.513	0.610
	Hope	0.402	0.634	5.970	<0.001
	Optimism	0.188	0.434	3.504	<0.001
Absorption ←	Self-efficacy	0.268	0.517	4.402	<0.001
	Resilience	0.006	0.077	0.565	0.575
	Hope	0.246	0.469	4.161	<0.001
	Optimism	0.040	0.200	1.489	0.142

The regression analyses using the total score of learning engagement as the dependent variable and the four dimensions of psychological capital as predictors indicate that some sub-dimensions of psychological capital significantly predicted the three dimensions of learning engagement, partially supporting Hypothesis 2. The results also clarified the differential predictive effects of the sub-dimensions (as shown in Figure 2):

- (1) Self-efficacy had the strongest predictive effect ($\beta = 0.635$, $p < 0.001$, $R^2 = 0.404$).
- (2) Hope was the second strongest predictor ($\beta = 0.613$, $p < 0.001$, $R^2 = 0.375$).
- (3) Optimism had limited predictive power ($\beta = 0.328$, $p < 0.05$, $R^2 = 0.108$).
- (4) Resilience did not show a significant predictive effect.

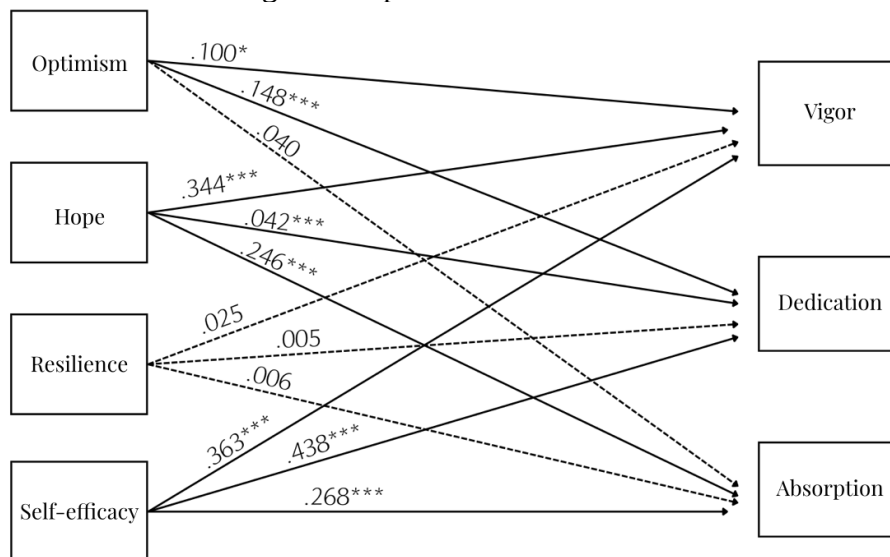


Figure 2 Framework

5. Discussion

This study examined the relationship between psychological capital and learning engagement among high school students. The results showed that the total score of psychological capital was significantly and positively correlated with the total score of learning engagement, partially supporting Hypothesis 1. Correlation analyses further revealed that, except for resilience, the three dimensions of psychological capital—self-efficacy, hope, and optimism—were significantly and positively associated with learning engagement. This finding is consistent with previous studies conducted among college students and adult populations (Luthans et al., 2010; Martínez et al., 2019). It also aligns with the Conservation of Resources Theory (Hobfoll, 2002) and Hope Theory (Snyder, 2002), which argue that positive psychological resources help individuals maintain vigor, dedication, and absorption in learning. [24]

The regression analysis results provided partial support for Hypothesis 2: psychological capital as a whole significantly predicted learning engagement, but at the sub-dimension level, only self-efficacy, hope, and optimism had significant predictive power, while resilience did not. This indicates that the different components of psychological capital play distinct roles in promoting learning engagement among high school students.

Overall, this study supports the developable and practical value of psychological capital. The findings provide evidence for school-based psychological health education and academic support. For example, interventions such as positive psychology courses or psychological training programs that enhance students' self-efficacy, hope, and optimism may effectively strengthen their learning engagement.

5.1 Differential Analysis of Psychological Capital Sub-dimensions

From the perspective of each dimension, self-efficacy had the strongest predictive effect on learning engagement, especially showing high correlations with dedication and vigor. This finding is consistent with Siu et al. (2013). According to Bandura's (1997) self-efficacy theory, individuals' belief in their own abilities directly drives goal commitment and sustained effort. Since high school students are at a stage where self-concept is still developing, confidence in their learning ability not only strengthens their recognition of the meaning of learning (dedication) but also energizes them to cope with challenges (vigor). However, self-efficacy may not significantly strengthen absorption. Confidence in one's own ability might lead students to attempt multiple tasks simultaneously or become distracted by other activities, reducing their ability to fully concentrate on a single task. Overall, this result further confirms the status of self-efficacy as a "core psychological resource," highlighting its especially prominent role in promoting learning engagement among adolescents.

The hope dimension ranked second in predictive power, significantly associated with both dedication and vigor. This aligns with the "goal–pathway" mechanism proposed by Snyder et al. (1991). Students with a high level of hope not only recognize the value of learning but can also plan effective strategies to achieve their goals.[25] This dual cognitive mechanism allows them to maintain motivation even under long-term academic pressure. Compared with college students, high school students' learning goals are more concrete (e.g., activities, exams). As such, the "pathway planning" function of hope can be more easily translated into actual engagement, explaining why hope demonstrated strong predictive power in this study.

The role of optimism was relatively limited, showing only weak correlations with vigor and dedication, and no significant effect on absorption. This result can be explained through Scheier and Carver's (1985) definition of optimism: as a "generalized positive expectation," optimism refers more to overall outlooks on life than to specific domains such as academics. [19] The optimism subscale used in this study emphasized general attitudes toward the future and surrounding people

and events. In contrast, the absorption dimension of learning engagement requires sustained focus on specific tasks. This "domain mismatch" may weaken optimism's predictive power. In addition, this may reflect the principle of moderation: excessive optimism might lead to underestimating the difficulty of learning tasks or poor time management, while moderate optimism can help buffer stress through positive attribution. Thus, optimism's influence on learning engagement may involve a threshold effect that future studies should investigate further.

The role of resilience was not significant, which differed from theoretical expectations and the original hypothesis. A closer look at the questionnaire items suggests that Zhang et al.'s (2010) resilience scale largely emphasizes emotional regulation (e.g., "I rarely get angry," "I do not care much about unpleasant things in life"), whereas Luthans and Youssef (2017) define resilience as the ability to recover from adversity and positively adapt or grow in difficult circumstances. [15] The items in this study were more about everyday emotional control and less about academic adversity, limiting their ability to capture students' actual resilience in contexts such as exam failures or intense college entrance pressure. Resilience is highly context-dependent. In this study's sample of international school students, the main challenges were routine academic tasks (e.g., homework difficulty) rather than major setbacks (e.g., failing college entrance exams). In such a relatively supportive environment with abundant external resources, the independent role of personal resilience in sustaining engagement may have been weakened. Moreover, the survey was conducted after exams had ended, when students were under relatively low stress, meaning their "resilience function" may not have been activated. The measurement instrument may therefore have failed to capture real resilience levels. This is consistent with Tang's (2019) view that the effects of resilience depend on specific adversity contexts: under low-pressure environments, its influence may be masked. Future research should incorporate stress variables to further test this relationship. [26]

5.2 Demographic Variables: Gender and Grade

For the gender variable, male students' mean scores were slightly higher than those of female students across all dimensions. Although these differences did not reach statistical significance, they still have some observational value. A possible explanation is that the international school curriculum emphasizes inquiry and practice, and male students may be more likely to display external confidence and initiative when facing challenging tasks, resulting in slightly higher scores in psychological capital dimensions such as self-efficacy and resilience. In terms of learning engagement, male students may invest more in observable behaviors such as class participation and task execution, leading to slightly higher mean scores compared to female students. However, since female students made up a larger proportion of the sample (69.09%) and the overall gender differences were small, the results did not reach statistical significance. This outcome also suggests that in an international education environment, gender has only a limited impact on students' positive psychological resources and learning engagement, which are jointly shaped by factors such as the curriculum system and teaching model.

For the grade variable, the results showed a decreasing trend of Grade 9 > Grade 10 > Grade 11. This trend may be associated with increasing grade level and academic pressure. Grade 9 students, who are just entering high school, are less familiar with the international curriculum system, and the course content at this stage is relatively easier. Their motivation to explore remains strong, which helps maintain higher levels of psychological capital and stronger enthusiasm for learning engagement. By contrast, Grade 10 and Grade 11 students face higher academic demands and greater pressure from college preparation, leading to the continuous consumption of psychological resources. As a result, their psychological capital tends to decline, and learning engagement is affected by academic burnout and goal uncertainty, lowering their average scores.

5.3 Extended Discussion

This study not only verified the positive association between psychological capital and learning engagement among high school students but also revealed differentiated mechanisms at the sub-dimension level, providing new contextualized evidence for the existing literature. Previous research has mostly focused on college students or adult groups (Siu et al., 2013; Martínez et al., 2019), generally finding that "hope" and "self-efficacy" are the core predictors of learning engagement. However, this study shows that among high school students, the effect of self-efficacy is particularly prominent, while the influence of hope is comparable to that observed in college students, and the effects of optimism and resilience are weaker. This suggests that the "resource effectiveness" of different dimensions of psychological capital is significantly moderated by educational stage and stress context, which is highly consistent with Hobfoll's (2002) Conservation of Resources theory emphasizing "resource–context matching."

Compared with conclusions based on college student samples (e.g., Gong et al., 2018, who reported a moderate positive correlation between optimism and learning engagement), this study's high school sample showed a stronger downward trend across grades and a weaker effect of optimism. [7] This may reflect the unique academic pressure and goal orientation of high school: the short-term intensity of entrance exams relies more on immediate self-efficacy and concrete goal pathways rather than long-term positive expectations. This finding provides new evidence for the applicability boundaries of psychological capital theory across developmental stages. It also implies that interventions for high school students should focus on "goal–pathway" style hope training and task breakdown with feedback, whereas college students may benefit more from cultivating long-term optimism.

Furthermore, the dimensional deconstruction approach adopted in this study offers inspiration for future research. While most prior studies have used the overall score of psychological capital to predict overall learning engagement, this study found differentiated associations between specific dimensions and sub-components of engagement. This suggests that future research could conduct more fine-grained longitudinal predictions focusing on single dimensions—for example, using self-efficacy to predict changes in vigor over time, or using hope to predict fluctuations in dedication before and after major exams. Such single-dimension predictions may help design more precise psychological intervention programs.

In addition, regarding demographic variables, this study observed a declining trend of psychological capital and learning engagement with increasing grade level. Combined with Wang et al.'s (2021) findings on threshold effects of academic pressure among high school students, this phenomenon suggests that future studies could introduce variables such as academic stress and sleep quality as control or moderating factors to explore how psychological capital buffers resource depletion in high-pressure environments. [27]

Finally, empirical data focusing on high school students remain scarce. This study provides some comparable data from a high school sample. Moreover, by using sub-dimension regression, it highlighted the core roles of self-efficacy and hope, enriching the fine-grained evidence for the psychological capital–learning engagement model.

5.4 Limitations and Future Research Directions

5.4.1 Limitations

Although this study identified unique patterns in the role of psychological capital among high school students, the relatively small sample size ($N = 55$) and its focus on a single school may limit the generalizability of the findings. In addition, the cross-sectional design restricted deeper

exploration of group differences (such as gender and grade) and limited the ability to verify causal mechanisms. Future research could expand the sample scope, adopt longitudinal designs to further examine the bidirectional relationship between psychological capital and learning engagement (Siu, 2013), revise or develop new measurement instruments and conduct experimental validation (e.g., creating academic-contextualized scales and incorporating academic stress), and include moderating variables such as teacher support to further improve the theoretical model.

5.4.2 Future Research Directions

(1) Sample expansion and cross-group comparison: Future studies could include high school students from different regions and school types, and even compare them with adult learner samples, to verify the distinctiveness of the high school stage.

(2) Longitudinal and experimental designs: Longitudinal research or intervention experiments could be conducted to examine changes in psychological capital dimensions over time and to clarify causal pathways.

References

- [1] Bandura, A. (1997). *Self-efficacy: The exercise of control*. Macmillan.
- [2] Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review*, 30(7), 879–889.
- [3] Cavus, M., & Gokcen, A. (2015). Psychological capital: Definition, components and effects. *British Journal of Education, Society & Behavioural Science*, 5(3), 244–255.
- [4] Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226.
- [5] Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.
- [6] Fang, L., Shi, K., & Zhang, F. (2008). Reliability and validity of the Chinese version of the Utrecht Work Engagement Scale–Student. *Chinese Journal of Clinical Psychology*, 16(6), 618–620. [in Chinese]
- [7] Gong, Z., Liu, Q., Jiao, X., & Tao, M. (2018). The influence of college students' psychological capital on study engagement. *Psychology*, 9(13), 2782–2793.
- [8] Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6(4), 307–324.
- [9] Jafri, M. H. (2013). A study of the relationship of psychological capital and students' performance. *Business Perspectives and Research*, 1(2), 9–16.
- [10] Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692–724.
- [11] Liu, X. (2016). The relationship between psychological capital and study engagement among vocational students. *Chinese Journal of Health Psychology*, 24(8), 1181–1185. [in Chinese]
- [12] Luthans, B. C., Luthans, K. W., & Jensen, S. M. (2012). The impact of business school students' psychological capital on academic performance. *Journal of Education for Business*, 87(5), 253–259.
- [13] Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, S. J. (2010). The development and resulting performance impact of positive psychological capital. *Human Resource Development Quarterly*, 21(1), 41–67.
- [14] Luthans, F., Vogelgesang, G. R., & Lester, P. B. (2006). Developing the psychological capital of resiliency. *Human Resource Development Review*, 5(1), 25–44.
- [15] Luthans, F., & Youssef-Morgan, C. M. (2017). Psychological capital: An evidence-based positive approach. *Annual Review of Organizational Psychology and Organizational Behavior*, 4(1), 339–366.
- [16] Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. Oxford University Press.
- [17] Mart ínez, I. M., Youssef-Morgan, C. M., Chambel, M. J., & Marques-Pinto, A. (2019). Antecedents of academic performance of university students: Academic engagement and psychological capital resources. *Educational Psychology*, 39(8), 1047–1067.
- [18] Mu, Z., & Huang, G. (2025). The future of school education in the era of artificial intelligence: An analysis based on new institutionalism in organizational sociology. *University Education*, 13, 8–11. [in Chinese]
- [19] Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, 4(3), 219–247.

- [20] Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students: A cross-national study. *Journal of Cross-Cultural Psychology*, 33(5), 464–481.
- [21] Schaufeli, W. B., & Bakker, A. B. (2004). Bevlogenheid: een begrip gemeten. *Gedrag & Organisatie*, 17(2), 89–112.
- [22] Siu, O. L. (2013). Psychological capital, work well-being, and work-life balance among Chinese employees. *Journal of Personnel Psychology*, 12(4), 170–181.
- [23] Siu, O. L., Bakker, A. B., & Jiang, X. (2013). Psychological capital among university students: Relationships with study engagement and intrinsic motivation. *Journal of Happiness Studies*, 15(4), 979–994.
- [24] Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13(4), 249–275.
- [25] Snyder, C. R., Irving, L. M., & Anderson, J. R. (1991). Hope and health. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective* (pp. 285–305). Pergamon Press.
- [26] Tang, Q. (2019). The influence of college students' psychological capital and social skills on career decision-making difficulties. *Journal of Anhui Business and Technical College (Social Science Edition)*, (2), 70–73. [in Chinese]
- [27] Wang, T., Liu, Q., Luo, H., & Liu, J. (2021). Threshold effects of study motivation, study pressure, and subjective well-being among high school students: Evidence from an eastern province in China. *Journal of East China Normal University (Educational Sciences)*, 39(3), 59–70. [in Chinese]
- [28] Yue, X. (2020). The relationship between psychological capital and academic achievement among college students: The mediating role of study engagement (Master's thesis, Shanxi University of Finance and Economics). [in Chinese]
- [29] Zhang, K., Zhang, S., & Dong, Y. (2010). Psychological capital: Measurement and its relationship with mental health. *Research on Psychology and Behavior*, 8(1), 58–64. [in Chinese]
- [30] Zhou, G. (2022). The relationship between positive psychological capital and study engagement among junior high school students (Master's thesis, Chongqing Qiu Jing Middle School). [in Chinese]