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Social Support and General Self-efficacy among Chinese Higher Vocational Students: The Mediating Role of Engagement and the Moderating Role of Procrastination

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ABSTRACT
This study examined the relationship between social support and general self-efficacy among Chinese higher vocational students, exploring the mediating effects of engagement and the moderating effect of procrastination. This research employed a cross-sectional correlational design and a questionnaire survey to collect data. Total 417 higher vocational students from four Chinese vocational and technology colleges participated in this study. The findings demonstrated that social support was positively associated with general self-efficacy. Moreover, the relationship between social support and general self-efficacy was mediated by engagement, suggesting that social support positively influences students' engagement, which, in turn, enhances their general self-efficacy. In addition, procrastination has been shown to be a moderator that disrupts the process of translating students' mastery experience into their general self-efficacy. Based on these results, a moderated mediation model was built. The research expands the explanatory scope of self-efficacy theory and provides practical implications for educators and policymakers in Chinese vocational education.

KEYWORDS
General self-efficacy; social support; engagement; procrastination; higher vocational students.

INTRODUCTION

With the rapid development of industrial technology, the Chinese government aims to transform the nation from a large country focused on education into an educational powerhouse. Thereby, vocational education as a distinctive type of education has a growing demand for high-quality education. The reason is that vocational and technology colleges are the primary institutions for cultivating highly skilled technical talent (Liu & Li, 2025; Sun et al., 2025). Well-trained higher vocational students will become professionals and play a pivotal role in advancing the progress and innovation of Chinese industrialization. When higher vocational students are confronted with academic challenges, career preparation, and life tasks, general self-efficacy can be a key driving force and positively affect their engagement, emotional attitudes, and behavioral tendencies. Thus, general self-efficacy is paramount as a critical forward-looking indicator for evaluating the effectiveness of vocational education (Fu et al., 2023; Wang & Song, 2022; Zimmerman, 2000). Improving general self-efficacy should be regarded as a priority in the training of higher vocational students. However, some studies have found that, compared with their undergraduate counterparts of the same age, Chinese higher vocational students tend to exhibit lower levels of general self-efficacy (Wang & Song, 2022; Yan, 2022). The root of this situation lies in the fact that vocational education in China often is a second choice. Higher vocational students who cannot gain admission to regular universities tend to attribute this unsatisfactory outcome to their own abilities. In turn, this self-evaluation will negatively affect their general self-efficacy (Jiang et al, 2022).

According to Bandura (1977), self-efficacy refers to people's beliefs in their ability to execute the actions required to achieve specific performance outcomes. Besides, Bandura argued that self-efficacy is task- and skill-specific (Bandura, 1997), whereas subsequent studies identified a general self-efficacy (Asanre & Chinaka, 2024; Luszczynska et al., 2005; Scholz et al., 2002; Sekerbayeva et al., 2023; Zhang et al., 2024). Schwarzer and Jerusalem (1995) characterized self-efficacy as a relatively stable and general belief in one's own capabilities. Given the practical situation of Chinese higher vocational students, current studies have shown that the main task they face is no longer confined to academic learning requirements. Instead, it is to cultivate comprehensive competencies such as professional operation skills, teamwork, communication, and problem-solving abilities (Han, 2024; Zhang et al., 2024). For this reason, assessing students' self-efficacy using a single type of self-efficacy cannot comprehensively capture their actual self-efficacy levels.

Compared with general undergraduate education, higher vocational education places students in a practice-oriented environment in which academic tasks, professional skill training, internship preparation, interpersonal cooperation, and future employment planning are closely intertwined. In such a context, students are required to respond to challenges across multiple situations rather than within a single academic domain. For this reason, general self-efficacy is particularly meaningful for higher vocational students, as it reflects a broader belief in one’s capacity to deal with diverse and changing demands. Examining the antecedents of general self-

efficacy in this group is therefore not only educationally relevant but also theoretically necessary.

Based on the above discussion, this study shifted the focus from academic self-efficacy to general self-efficacy, treating it as the core variable for constructing the explanatory framework and further exploring its antecedent factors. Although a large number of studies have confirmed the positive role of academic self-efficacy in academic situations (Adigun & Ndwandwe, 2022; Cai & Lian, 2022; Fu & Wang, 2023; Khan, 2023; Nair & Sutar, 2023), there is still insufficient research on general self-efficacy as a psychological resource for coping with cross-situational challenges for higher vocational students. Moreover, although previous studies have generally treated it as an antecedent or a mediating variable, they have also confirmed its importance (Fu & Wang, 2023; Nair & Sutar, 2023; Warshawski, 2022; Yan, 2022; Zhang et al., 2023). Research investigating its formation and underlying mechanism remains limited. To address this research gap, the current study introduces a mediator and a moderator to clarify the mechanisms underlying these relationships.

Theoretical Framework and Literature Review

From a social cognitive theory perspective, the development of general self-efficacy among higher vocational students should be understood as the interaction among environmental resources, behavioral processes, and self-regulatory tendencies. Social support represents an environmental condition that conveys recognition, available help, and emotional assurance. Engagement reflects the extent to which students invest energy, attention, and persistence in daily tasks. Procrastination reflects a tendency towards self-regulatory failure that may weaken the transformation of participation into effective mastery-related information. Therefore, integrating these three variables into one explanatory framework can provide a more complete understanding of how general self-efficacy is formed and why students exposed to similar environments may still differ in their efficacy beliefs.

General Self-efficacy and Social Support

Based on social cognitive theory (SCT), Bandura (1997) proposed that social support influences self-efficacy by providing external resources, such as vicarious experiences and verbal persuasion. It is identified as a key environmental factor affecting the general self-efficacy of higher vocational students (Bandura, 1997). Social support is generally defined as assistance and resources provided by an individual's social networks, including emotional, instrumental, and financial support (Cohen & Wills, 1985). Furthermore, Zimet et al. (1990) emphasized that perceived social support (i.e., encouragement and company) is more important than practical support (i.e., financial aid). Specifically, even an individual from a well-off family may feel neglected by their parents, thus social support is perceptibility. Then, social support is categorized by Zimet et al. (1990) into three dimensions, including family support, friend support, and significant others' support (i.e., spouses, supervisors, and partners). In terms of the stress-buffering mechanism of social support, it can help individuals effectively manage stress, improve physical and psychological well-being, and even increase their overall life satisfaction

(Cohen & Wills, 1985). The resources provided by social support systems are indispensable for maintaining individuals' psychosocial adjustment. In educational research, social support has been empirically shown to be significantly associated with students' self-efficacy (Mana et al., 2022; Su et al., 2024). Based on the reciprocal determinism principle of Social Cognitive Theory (SCT), social support, as a key environmental factor, enhances the general self-efficacy of higher vocational students by providing positive verbal persuasion and vicarious experiences, thereby improving their physiological and emotional states (Bandura, 1977, 1997).

In the Chinese cultural context, the function of social support should not merely be understood as the availability of practical help. It is also embedded in enduring family responsibility, relational interdependence, and a collectivist orientation that values connectedness and mutual obligation. For higher vocational students, family support often provides emotional security, normative guidance, and a sense of being backed when encountering difficulties. At the same time, support from teachers and other significant others may become particularly important because these figures provide role recognition and socially valued evaluation within the educational setting. Therefore, the relationship between social support and general self-efficacy among Chinese higher vocational students should be interpreted within a cultural framework in which self-belief is shaped not only by individual experience but also by significant relational ties.

Nevertheless, previous research has shown that the influence of social support on students may vary depending on its source (Alsubaie et al., 2019). Alsubaie et al. (2019) found that support from family and friends primarily influences students' overall quality of life, whereas the quality of social relationships is mainly affected by support from friends and significant others. In contrast, it is reported that only school support positively affects students' academic achievement, while the effects of family and friend support were not significant. These different findings further highlight the importance of examining the distinct influences of different sources of social support on students. If different types of social support vary significantly in their effects, their relationships with higher vocational students' general self-efficacy may also differ. Therefore, it is necessary to have a more detailed understanding of the different types of social support for higher vocational students in their current situation.

Currently, higher vocational students face a more complex social network. On the one hand, most Chinese higher vocational students live in collective dormitories, which separate them from their families but also provide opportunities to establish new social relationships and access new forms of social support within the school environment. This indicates that the relative contribution of family support within a personal overall social support may diminish, while other types of social support become more important (Deng, 2021; Huang, 2022). These students can still maintain close contact with their family members and friends through modern technologies such as smartphones (Baecker et al., 2014). The simultaneous occurrence of the above two situations results in the current pattern of social support among higher vocational students being less clear. Therefore, it is necessary to examine the different types of social

support in greater detail to get a thorough understanding of higher vocational students' social support systems and conditions.

In summary, this study incorporated social support as a second-order factor within a structural equation model to examine its relationship with general self-efficacy. Additionally, a second-order CFA was conducted to assess the differential representational strength (i.e., standardized factor loadings) of each subdimension on the higher-order social support construct, thereby characterizing the relative contributions of the respective sources to the construct.

H1: Social support has a positive effect on general self-efficacy.

Engagement as a mediator

Existing studies have found that the relationship between social support and general self-efficacy involves various mediating mechanisms (Chen et al., 2025; Zhang et al., 2024). Bandura (1982) suggested that this is because the social environment can both facilitate and constrain individuals' behaviors and psychological states. Specifically, when social support, as a social environmental factor, provides verbal persuasion or vicarious experiences that are inconsistent with individuals' actual mastery experiences or cognitive evaluations, it may not enhance self-efficacy but instead undermine it. This phenomenon indicates that the mechanism linking social support and general self-efficacy is not direct and involves additional psychological or behavioral processes that affect perception, internalization, and responses to supportive information. This study introduces engagement as a mediating variable. The reason for choosing engagement as a mediator is that it is a critical process that transforms external social support into internalized, stable efficacy beliefs. Previous studies have proposed that social support, as an external resource, not only directly reduces stress during learning and academic tasks but also improves students' psychological well-being and life satisfaction. At the same time, these positive states and emotions could encourage students to adopt proactive coping strategies that boost their academic engagement (Chen et al., 2023; Wang & Eccles, 2012; Xerri et al., 2018).

According to Schaufeli (2017), general engagement is comparable to academic engagement and is similarly characterized by vigor, absorption, and dedication. This scholar emphasized that general engagement is a positive and fulfilling psychological state that exists not only in work- or study-related contexts but also in individuals' daily activities, such as learning, volunteering, and even household cleaning (Schaufeli, 2017). There are two reasons for this study adopts general engagement rather than academic engagement as the mediating variable. Firstly, as mentioned earlier, higher vocational students are facing more complex and diversified challenges that have extended beyond academic requirements, including the cultivation of professional skills and comprehensive competencies such as teamwork, communication, and problem-solving (Han, 2024; Zhang et al., 2024). Therefore, general engagement, as a comprehensive state, can more effectively capture the overall participation level of higher vocational students across multiple contexts. Another reason for selecting this construct is to ensure consistency with the concept of general self-efficacy in the present study,

which provided a more integrated examination of higher vocational students' positive psychological functioning and enhanced the internal coherence of the theoretical model.

Social cognitive theory (SCT) proposes that the formation of enduring self-efficacy generally depends on information about one's capabilities, typically provided by personal experiences, behaviors, or psychological states (Bandura, 1997). In particular, for higher vocational students, perceptions of interest, meaning, perseverance, commitment, and effort during engagement can yield capability-related information that serves as an important resource for enhancing general self-efficacy (Bandura, 1997; Schaufeli, 2017). Furthermore, even when students do not successfully complete a task, the positive states they experience during engagement, such as concentration and vigor, can still enhance their general self-efficacy. Empirical studies have also confirmed the association between engagement and self-efficacy (Al-Hamdan & Bani Issa, 2022; Li et al., 2022; Sökmen, 2021). Overall, students' engagement serves as a mediating mechanism in this process, with social support positively influencing it, which in turn enhances the general self-efficacy of higher vocational students. Therefore, this study proposes the following hypothesis:

H2: Students' engagement mediates the relationship between social support and general self-efficacy.

Procrastination as a moderator

To further explore how social support influences general self-efficacy, this study introduces procrastination as a moderating variable and, on this basis, constructs a moderated mediation model centered on engagement. Procrastination refers to the tendency to unnecessarily delay or defer tasks that ought to be completed (Gafni & Geri, 2010; Steel, 2007). Previous research has found that this behavior is prevalent among higher vocational students (Chen et al., 2021; Li, 2017; Liu & Zhou, 2025). Social Cognitive Theory (SCT) defines procrastination as a performance of self-regulatory failure (Bandura, 1997; Steel, 2007). It not only results in task interruption, delayed initiation, or incomplete planning, which weakens the positive influence of students' engagement on general self-efficacy, but also leads to frequent failures that accumulate unsuccessful experiences (Steel, 2007). As a result, repeated failure experience further erodes higher vocational students' overall sense of self-efficacy (Bandura, 1997; Steel, 2007). Moreover, when procrastination becomes a cross-situationally stable behavioral tendency, higher vocational students often internalize it as a negative appraisal of self-efficacy. Then, this negative appraisal further undermines their general self-efficacy, thereby creating a vicious cycle (Bandura, 1997; Schouwenburg, 2005; Steel, 2007).

However, although procrastination presents a certain trait-like stability, previous research has proved that some interventions can effectively reduce and modify it (Cherrier et al., 2023; Ozmen et al., 2023; Salguero-Pazos & Reyes-de-Cózar, 2023). This variability of procrastination underscores the moderator role of it. Specifically, higher vocational students with a low level of procrastination tend to be proactively engaged in their academic and daily tasks. Therefore, during the process of task completion, they can accumulate abundant direct mastery

experiences and effectively strengthen the beliefs about their capabilities (Steel, 2007). In this process, engagement can be directly translated into efficient sources of general self-efficacy. At the same time, higher vocational students tend to rely less on external social support because they believe they can complete tasks on their own. By contrast, students with a high level of procrastination tend to delay or fail to complete goal-directed tasks, which makes it difficult to obtain positive feedback from task engagement. As a result, the facilitative effect of engagement on general self-efficacy is weakened. Based on this situation, these students tend to require greater external social support to compensate for deficits in self-regulation and to rebuild their sense of control and confidence in their capabilities (Bandura, 1997). This distinction between levels of procrastination indicates that students' procrastination not only moderates the strength of the direct effect of engagement on general self-efficacy but also moderates the indirect effect in which social support affects general self-efficacy through the mediating role of engagement. Therefore, the following hypotheses were proposed:

H3: The relationship between engagement and general self-efficacy is moderated by Procrastination.

H4: The indirect effect of social support on general self-efficacy through engagement is moderated by Procrastination.

Research Objective and Hypotheses

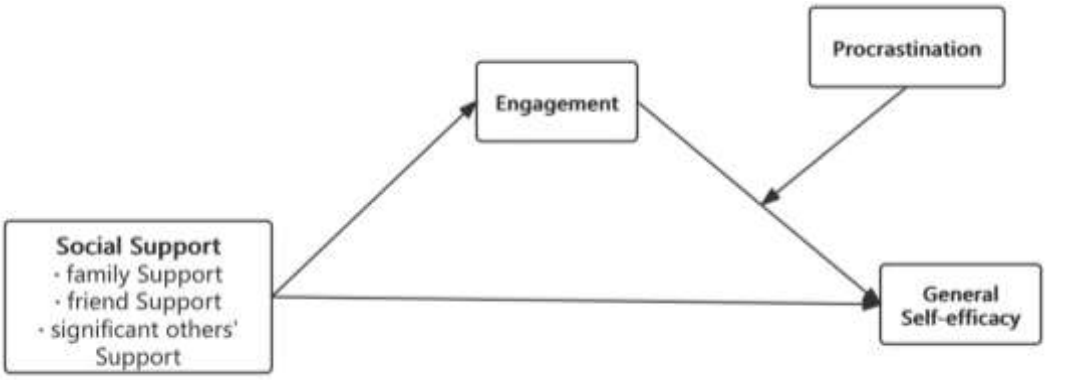
The originality of the present study lies in three aspects. First, it shifts the focus from academic self-efficacy to general self-efficacy, which better aligns with the multi-context demands faced by higher vocational students. Second, it treats social support as a higher-order construct and examines the relative representational strength of support from family, friends, and significant others within the same model. Third, it combines mediation and moderation in a single framework by explaining how social support is translated into general self-efficacy through engagement and under what conditions this process is weakened by procrastination. In this way, the study moves beyond confirming whether social support matters and clarifies how and when it matters.

Accordingly, the objective of the present study was to construct and test a moderated mediation model linking social support, engagement, procrastination, and general self-efficacy among Chinese higher vocational students. Specifically, this study sought to answer three questions. First, how does social support positively predict general self-efficacy among higher vocational students? Second, how does engagement mediate the relationship between social support and general self-efficacy? Third, how does procrastination moderate the effect of engagement on general self-efficacy and the indirect effect of social support on general self-efficacy through engagement?

In summary, based on these objectives and the hypotheses stated earlier, a moderated mediation model was established and presented in Figure 1.

Figure 1.

Moderated Mediation Model



METHOD

Research design

This study adopted a cross-sectional correlational design. This design was appropriate because the study aimed to examine the relationships among social support, engagement, procrastination, and general self-efficacy, as well as the mediation and moderation of these variables at a single point in time. The study aimed to test an explanatory model of association rather than to establish causal effects. Therefore, collecting questionnaire data during one survey period provided an appropriate and efficient basis for evaluating the proposed theoretical relationships among the focal variables.

Participants and study sample

The present study was conducted during September and October 2025. Participants were collected from four vocational and technology colleges, including Hengdian College of Film & Television in the East, Guangdong Lingnan Institute of Technology in the South, Southwest Guizhou Vocational and Technical College in the West, and Shandong Polytechnic in the North of China. The four colleges are located in different regions, and each represents a different segment of vocational and technical education. Shandong Polytechnic and Guangdong Lingnan Institute of Technology focus on science- and engineering-oriented and business-oriented vocational education, respectively. Southwest Guizhou Vocational and Technical College is a comprehensive vocational and technical institution, and Hengdian College of Film & Television specializes in film, media, and performing arts. The aim of this selection of colleges with diverse types and regional distributions is to enhance sample diversity and reduce potential biases stemming from homogeneous research settings. Furthermore, sufficient sample size can ensure the robustness and reliability of the research data. This study determined the sample size using traditional rules of thumb for survey research, which recommend a sample size–to–item ratio of approximately 5:1 to 10:1 (Gorsuch, 1983; Jackson, 2003). Cohen et al. (2002) proposed that larger sample sizes in quantitative research yield more reliable results. Therefore, this study

adopted a 10:1 maximum ratio. The instrument comprised 40 items, so the target sample size was set at 400.

Research procedure and data collection

Data collection was conducted online through Wenjuanxing during September and October 2025. Students from the four participating colleges completed the questionnaire after reading the introductory page and providing informed consent. The introductory page explained the purpose of the study, emphasized the confidentiality of responses, and reminded participants that there were no right or wrong answers, encouraging them to respond according to their actual situation. After the survey period ended, the returned questionnaires were screened for invalid responses. Responses completed in less than one minute or showing the same option across all items were removed, and 417 valid questionnaires were retained for the final analyses. A total of 447 students were invited to participate in the survey, and 417 questionnaires were returned, yielding an initial participation rate of 93.29%. Questionnaires containing missing responses were excluded during data screening. Therefore, the final dataset used for analysis did not require further treatment of missing data.

Research Instruments

The questionnaires in this study comprised students' demographic information (e.g., gender, age, institution, grade, and major), the Multidimensional Scale of Perceived Social Support (MSPSS), the Utrecht General Engagement Scale (UGES), the General Self-Efficacy Scale (GSE), and the General Procrastination Scale-9 (GPS-9). This study employed established instruments and administered them in Chinese. Because the purpose of the study was empirical model testing rather than scale development, the appropriateness of the measures in the present sample was verified through internal consistency analysis and confirmatory factor analysis before the substantive hypotheses were tested.

The present study did not involve the development of new instruments. Instead, it employed established scales and examined their suitability in the current sample before testing the structural relationships. All items were administered in Chinese, and the adequacy of the measures was evaluated through internal consistency coefficients and confirmatory factor analyses. This procedure ensured that the subsequent hypothesis testing was based on instruments showing acceptable reliability and construct validity among Chinese higher vocational students.

Social Support

This study assessed the social support of higher vocational students using the Multidimensional Scale of Perceived Social Support (MSPSS), proposed by Zimet et al. (1988). This questionnaire comprised three subscales totaling 12 items, with four items per subscale, including family, friends, and significant others. An example of a family-related item was " My family really tries to help me ", an example of a friend-related item was " I can talk about my problems with my friends ", and an example of a significant others-related item was " There is a special person who is around when I am in need ". Responses were collected using a 7-point Likert scale ranging

from 1 ("very strongly disagree") to 7 ("very strongly agree") (Zimet et al., 1988). In this study, the Cronbach alpha coefficient for MSPSS was 0.923. The CFA model fit indices are χ2/df = 1.645, CFI = 0.992, TLI = 0.989, SRMR = 0.020, RMSEA = 0.039.

Engagement

The Utrecht General Engagement Scale (UGES) was utilized to assess students' general engagement in daily activities. This questionnaire included 9 items with three subscales: Vigor (3 items), Dedication (3 items), and Absorption (3 items). An example of a Vigor-related item was " At my daily activities, I feel bursting with energy ", a Dedication-related item was " My daily activities inspire me ", and an Absorption-related item was " I feel happy when I am doing daily activities intensely " (Schaufeli, 2017). All engagement items were scored on a 5-point Likert scale ranging from 1 (never) to 5 (always). In this study, the Cronbach alpha coefficient for UGES was 0.824. The CFA model fit indices are χ2/df = 2.291, CFI = 0.975, TLI = 0.962, SRMR = 0.031, RMSEA = 0.056.

General Self-efficacy

This study used the General Self-Efficacy Scale (GSE) to assess general self-efficacy among higher vocational students. The GSE consists of 10 items, and participants respond to each item using a 4-point Likert scale ranging from 1 (“not true at all”) to 4 (“exactly true”). Sample items for general self-efficacy include:" I can always manage to solve difficult problems if I try hard enough " and " It is easy for me to stick to my aims and accomplish my goals " (Schwarzer & Jerusalem, 1995). In this study, the Cronbach alpha coefficient for GSE was 0.966. The CFA model fit indices are χ2/df = 2.448, CFI = 0.988, TLI = 0.985, SRMR = 0.016, RMSEA = 0.059.

Procrastination

The 9-item General Procrastination Scale-9 (GPS-9) is a validated tool utilized to assess procrastination behavior among higher vocational students (Sirois et al., 2019). For instance, sample items for general self-efficacy included " I am continually saying I’ll do it tomorrow ", and " In preparing for some deadlines, I often waste time by doing other things ". Participants could answer these items on a 5-point Likert scale from 1 (false) to 5 (true of me). Noticeably, items 5, 7, and 9 are reverse-scored. In this study, the Cronbach alpha coefficient for GPS-9 was 0.902. The CFA model fit indices are χ2/df = 1.670, CFI = 0.989, TLI = 0.986, SRMR = 0.024, RMSEA = 0.040.

Data analysis

Data were analyzed by SPSS 26.0 and AMOS 24.0. Common method bias, descriptive, and correlational analyses were conducted in SPSS. AMOS 24.0 was employed to estimate the hypothesized paths, test mediation effects, and evaluate model fit indices. Moderation effects were examined by Process Macro V4.0 plug-in (Hayes, 2013) in SPSS.

RESULTS

Preliminary analysis

Before conducting the hypothesis tests, the basic statistical assumptions for the subsequent analyses were examined. As shown in Table 1, the skewness and kurtosis values for general self-efficacy, social support, engagement, and procrastination were within an acceptable range, indicating that the data did not exhibit serious distributional abnormalities. In addition, the correlations among the focal variables shown in Table 2 were moderate rather than excessively high, suggesting that serious multicollinearity was unlikely to affect the regression and structural estimates. Regarding linearity, the observed relationships among the focal variables were in the expected directions, and the satisfactory fit of the structural mediation model further supported the appropriateness of using linear analytical procedures in the present study.

Table 1.

Descriptive Statistics of the Variable

Variables	Minimum	Maximum	M	SD	Skewness	Kurtosis
1. GSE	1	3.8	2.381	1.025	-0.048	-1.533
2. SS	1.17	6.83	4.8	1.318	-0.948	0.555
3. Engagement	1	4.78	2.824	0.796	-0.022	-0.502
4. Procrastination	1.22	5	3.107	0.935	-0.106	-0.861

Note. *N* = 417. "SS" = social support, "GSE" = general self-efficacy.

Table 2.

Correlation Analysis among Variables.

Variables	1	2	3
1. GSE	1		
2. SS	0.459***	1	
3. Engagement	0.481***	0.427***	1

Note. * p<0.05 ** p<0.01 *** p<0.001

Descriptive statistics showed that social support had the highest mean score among the focal variables, whereas general self-efficacy was at a comparatively moderate level. The skewness and kurtosis values for all variables were within an acceptable range, indicating that the data did not show serious distributional abnormality. Correlation analysis further showed that social support was positively related to general self-efficacy and engagement, and engagement was positively related to general self-efficacy. These preliminary results indicate that the focal variables were associated in the expected directions and provide an initial basis for testing Hypothesis 1 and Hypothesis 2. In summary, the descriptive and diagnostic results showed acceptable data quality, no serious distributional problems, and theoretically consistent correlations among the main variables. These findings indicated that the data were appropriate for the subsequent structural analyses.

Common method bias test

Given that all variables in this study were measured using a single self-report questionnaire administered at a single point in time, the findings are susceptible to common-method bias. To effectively control for common method bias, procedural remedies were first implemented. The survey was administered anonymously, and the consent form emphasized that answers would not be judged as right or wrong to reduce social desirability concerns and encourage honest self-reports (Podsakoff et al., 2003). In addition, this study sampled higher vocational students from multiple vocational and technical colleges across China to enhance sample heterogeneity. In addition, Harman's single-factor test (Harman, 1976) was conducted by performing an exploratory factor analysis on all questionnaire items. Eight factors with eigenvalues greater than 1 were extracted. The first factor accounted for 34.590% of the variance, below the 40% threshold, indicating that common method bias is unlikely. In summary, the procedural remedies and the Harman test result suggest that common method bias was unlikely to substantially distort the relationships among the focal variables. The main purpose of this diagnostic step was therefore to confirm that the subsequent model results could be interpreted with reasonable confidence.

Path analysis

The mediating role of engagement

The hypothesized structural mediation model demonstrated a good fit to the data, χ^2 (425) = 600.096, $p < .001$, $\chi^2/df = 1.412$, CFI = .982, TLI = .980, RMSEA = .031, and SRMR = .030. In the measurement model, social support was specified as a second-order construct comprising family support, friend support, and significant others' support. All three first-order factors loaded significantly on the higher-order construct, with family support showing the strongest loading, followed by significant others' support and friend support. These results indicate that the measurement structure was acceptable for testing the substantive hypotheses.

Hypothesis 1 proposed that social support would positively predict general self-efficacy. The structural model showed a significant direct positive path from social support to general self-efficacy, B = .249, p = .001, indicating that students who perceived stronger social support tended to report higher general self-efficacy. Accordingly, Hypothesis 1 was supported.

Table 3.

Mediation Model Test

Effect Type	Pathway	Estimate	Lower	Upper	p	PTE
Indirect effect	SS→Engagement→GSE	0.238	0.147	0.397	0.000	48.77%
Direct effect	SS→GSE	0.249	0.108	0.417	0.001	51.02%
Total effect	SS→GSE	0.488	0.373	0.630	0.000	

Note. "SS" = social support, "GSE" = general self-efficacy, "PTE" = Proportion of total effect

Hypothesis 2 proposed that engagement would mediate the relationship between social support and general self-efficacy. The bootstrap results showed that the indirect effect of social support on general self-efficacy through engagement was significant, B = .238, 95% CI [.147,

.397]. At the same time, the direct effect of social support on general self-efficacy remained significant after engagement was included, B = .249, 95% CI [.108, .417]. This pattern indicates partial mediation. In substantive terms, stronger social support was associated with higher engagement, which in turn contributed to stronger general self-efficacy. Therefore, Hypothesis 2 was supported.

Moderated mediation model test

Hypothesis 3 proposed that procrastination would moderate the relationship between engagement and general self-efficacy. The interaction between engagement and procrastination was significant and negative, B = -.172, p = .001, indicating that procrastination weakened the positive relationship between engagement and general self-efficacy. The simple slope results further showed that engagement predicted general self-efficacy more strongly for students with low procrastination, B = .617, p < .001, than for students with high procrastination, B = .296, p < .001. In other words, engagement was translated into stronger efficacy beliefs more effectively when students procrastinated less. Therefore, Hypothesis 3 was supported.

Table 4.

Results of moderation analysis.

Variables	Model 1	Model 2	Model 3
Constant	0.631***	0.053	2.433***
Engagement	0.620***	0.460***	0.456***
Procrastination		0.331***	0.317***
Engagement*Procrastination			-0.172***
N	417	417	417
R^2	0.231	0.307	0.324
Adjusted R^2	0.229	0.304	0.319
F value	$F(1,415)=124.872, p=0.000$	$F(2,414)=91.760, p=0.000$	$F(3,413)=66.093, p=0.000$
ΔR^2	0.231	0.076	0.017
ΔF value	$F(1,415)=124.872, p=0.000$	$F(1,414)=45.313, p=0.000$	$F(1,413)=10.534, p=0.001$

Note. Dependent variable = general self-efficacy, * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Hypothesis 4 proposed that procrastination would moderate the indirect effect of social support on general self-efficacy through engagement. The conditional indirect effect was stronger at low levels of procrastination, Effect = .128, 95% CI [.083, .179], than at high levels of procrastination, Effect = .070, 95% CI [.024, .121]. In addition, the index of moderated mediation was significant, Index = -.031, 95% Boot CI [-.062, -.002], indicating that the indirect pathway from social support to general self-efficacy through engagement became weaker as procrastination increased. Therefore, Hypothesis 4 was supported.

Table 5.

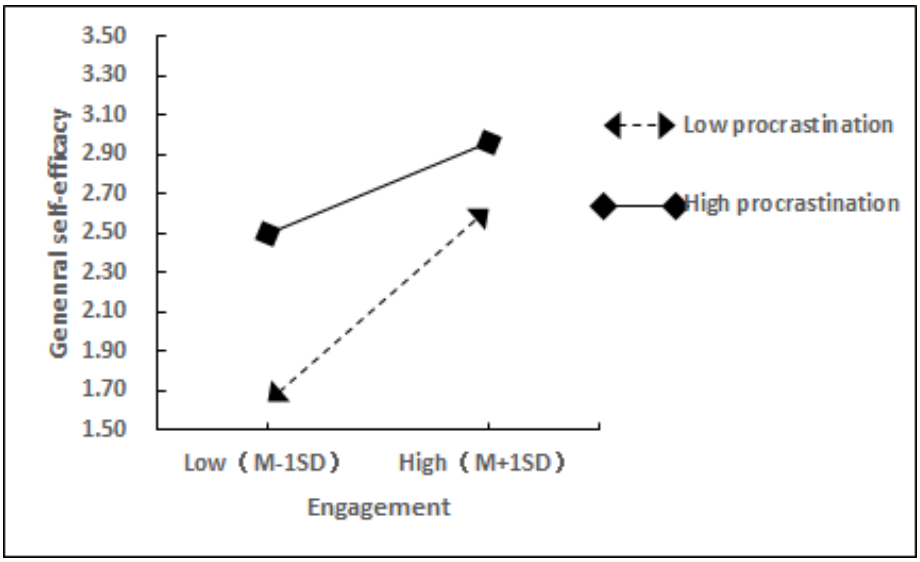
Simple Slope Analysis for the Moderating Effect of Procrastination.

Level of Moderator	B	SE	*t*	*p*	95% CI	
Mean level	0.456	0.057	7.987	0.000	0.344	0.569
High Level (+ 1 SD)	0.296	0.076	3.873	0.000	0.146	0.446
Low Level (-1 SD)	0.617	0.075	8.254	0.000	0.470	0.764

Note. "B" = Regression coefficient, "SE" = Standard error.

Figure 2.

Moderation plot with procrastination



In summary, the hypothesis tests consistently supported the proposed moderated mediation model. Social support positively predicted general self-efficacy, and engagement partially explained this relationship. At the same time, procrastination weakened both the direct contribution of engagement to general self-efficacy and the indirect effect of social support operating through engagement. Overall, the results indicate that supportive environments foster stronger efficacy beliefs partly by enhancing students' engagement, but this beneficial process becomes less effective when procrastination is high.

DISCUSSION

The present findings support all four hypotheses. Social support positively predicted general self-efficacy, and engagement partially mediated this relationship. In addition, procrastination weakened both the positive effect of engagement on general self-efficacy and the indirect effect of social support on general self-efficacy through engagement. The following discussion focuses

on these three findings and explains their theoretical and practical implications for Chinese higher vocational students.

The findings support Hypothesis 1 and indicate that social support is a significant positive predictor of general self-efficacy among Chinese higher vocational students. This result is consistent with recent evidence showing that perceived social support positively predicts general self-efficacy among postgraduate students in China (Zhang et al., 2024). It also accords with Mana et al. (2022), who found that social support operates as an important external resource for students' self-efficacy even when other internal psychological resources are also considered. From a social cognitive perspective, these convergent findings suggest that supportive relationships provide recognition, reassurance, and accessible help, which make students more likely to interpret challenges as manageable rather than threatening. In the present study, the second-order factor results further showed that family support had the strongest representation within the overall social support construct, followed by significant others' support and friend support. This suggests that although higher vocational students live in a relatively independent school environment, family remains the most stable source of perceived support, while teachers and other significant others also play an important role in shaping students' efficacy beliefs.

The result suggests that engagement partially mediates the relationship between social support and general self-efficacy, thereby supporting Hypothesis 2. This finding is consistent with recent research showing that social support promotes students' academic engagement through positive psychological processes such as life satisfaction and academic motivation (Chen et al., 2023). It also resonates with evidence from Chinese college students showing that learning engagement is positively associated with self-efficacy and can mediate the association between self-efficacy and achievement (Luo et al., 2023). Similarly, Meng and Zhang (2023) reported that academic engagement mediated the effect of academic self-efficacy on academic performance, highlighting the close connection between efficacy beliefs and sustained involvement in learning tasks. Taken together, these studies support the interpretation that engagement is not merely a behavioral outcome but a psychologically meaningful process through which external support is converted into capability related experience. When higher vocational students feel supported, they are more willing to invest energy, persistence, and attention in study and daily tasks. During this engagement process, they accumulate mastery related information and a stronger sense of control, which can then be internalized into more stable general self-efficacy.

Third, the results demonstrated that both the direct effect of engagement on general self-efficacy and the indirect effect of social support on general self-efficacy through engagement were moderated by procrastination. Hypotheses 3 and 4 were therefore confirmed. This pattern is consistent with evidence that procrastination is closely tied to self-regulatory weakness among college students (Wang et al., 2021). It is also in line with findings showing that self-efficacy is negatively associated with academic procrastination and can buffer

part of its adverse influence on students' functioning (Li et al., 2020). Although those studies examined academic self-efficacy, their results help explain why the positive contribution of engagement became weaker at higher levels of procrastination in the present study. When students delay action, interrupt task completion, or approach tasks only under time pressure, the positive information that should emerge from engagement becomes less stable and less likely to be interpreted as evidence of capability. In this sense, procrastination does not simply coexist with lower efficacy, but obstructs the conversion of engagement into mastery related experience. Therefore, higher vocational students with low levels of procrastination can translate their participation into stronger efficacy beliefs more efficiently, whereas those with high procrastination lose part of the benefit that engagement would otherwise bring.

Besides, this study has practical significance for higher vocational education in China. First of all, it provides a theoretical framework that guides higher vocational students in gaining insight into their internal psychological states and resources. As mentioned above, many Chinese higher vocational students exhibit low self-efficacy due to prior academic setbacks. This study provides a clear pathway for self-directed improvement of self-efficacy, helping these students identify controllable variables, such as proactively cultivating richer social support, increasing engagement, and managing procrastination. This approach not only enhances general self-efficacy but also restores students' initiative, enabling them to reinterpret past setbacks through a personal-growth lens. Secondly, this study found that different types of social support have different effects on general self-efficacy. Specifically, family support and significant others' support present stronger predictive power than friend support. This discovery deepens our understanding of the psychological mechanisms underlying social support. In the educational context, college supervisors and educators, as significant others in students’ lives, should fully recognize the unique value of their support. They can effectively facilitate the development of higher vocational students' general self-efficacy through intentionally providing emotional care, opportunities for mastery experiences, and positive feedback. Third, the mediating role of engagement has been demonstrated to be a positive psychological state and a source of behavioral feedback, which serves as a valuable resource for enhancing general self-efficacy among higher vocational students. These findings imply that interventions to promote self-efficacy should not be limited to verbal encouragement. Instead, designing and optimizing tasks and environments that elicit and sustain deep engagement and reduce procrastination, thereby providing continuous, positive behavioral feedback, might be more effective. Higher vocational students can build accurate self-evaluations by gaining positive experiences through actionable, progressive steps, which directly offset the guilt and sense of failure associated with procrastination.

Conclusion and Recommendations

The present study investigated the relationship between social support and general self-efficacy among Chinese higher vocational students. Results have proved that social support is positively related to general self-efficacy. The mediating role of engagement and the moderating role of

procrastination represented a potential mechanism underlying the relationship between social support and general self-efficacy. The findings of this study not only highlight the key facilitators of students' self-efficacy beliefs (social support and engagement) but also underscore the destructive threat posed by procrastination. On the one hand, this study suggested that students should take the initiative to seek positive social support and strengthen their regulation and control of their own behavior. Vocational educators are not only providers of support but also catalysts for task participation and interventionists in behavior regulation. They should guide and assist students in developing self-efficacy. Establishing solid and enduring self-efficacy among Chinese higher vocational students depends on the collaborative efforts of students, educators, and colleges.

Although this study's findings contribute to a new theoretical model and provide practical guidance for higher vocational students and vocational educators, several limitations remain to be addressed in future research. The present research employed a cross-sectional survey design, which limits the ability to draw causal inferences from the proposed model. Additionally, self-reported questionnaire data is highly dependent on respondents' honesty, sincerity, and emotional state, which may reduce data accuracy. Therefore, adopting experimental or longitudinal designs to generate more diverse data should be considered in future research, and it can provide stronger empirical evidence. Another limitation is that the higher vocational students in China are the only target population. While this study provides valuable insights for this specific group, the findings may have limited generalizability to other types of student groups or cultural backgrounds. Therefore, this research should be replicated among different populations to improve the generalizability.

Furthermore, this study's findings demonstrated only the mediating role of engagement and the moderating effect of procrastination; other psychological and behavioral mechanisms may also serve as mediators or moderators to influence the relationship between social support and general self-efficacy. Future research could incorporate additional mediators or moderators to broaden the study's scope, such as personality traits, gender, or attribution strategies. Based on the present findings, several recommendations can be proposed for higher vocational education practice. Colleges should strengthen multi-source support systems by encouraging effective communication between families, teachers, and students, while also ensuring that support is perceived as available and meaningful in students' daily lives. In addition, classroom teaching, practical training, and student management should be designed to sustain engagement through clear tasks, progressive goals, and timely feedback. At the same time, behavioral guidance aimed at reducing procrastination should be integrated into routine educational support so that students can more effectively translate their participation into confidence in their own capabilities.

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