

Teacher and parental support as predictors of higher vocational college students' academic performance: the mediating role of learning engagement

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ABSTRACT

Drawing on social support theory, self-determination theory, and engagement theory, this study examines how teacher and parental support relate to academic performance in Chinese higher vocational colleges through learning engagement. This is one of the few studies in this context that integrates teacher support, parental support, and learning engagement in a single mediation model, clarifying how school- and home-based support systems work together to shape students' academic performance. Together, these theories suggest that external support enhances performance primarily through engagement, which leads to the proposed mediation hypotheses. Survey data were collected from 360 students across three higher vocational colleges in Shandong Province, China. Using mediation analysis, results show that both teacher support and parental support significantly predict academic performance. Learning engagement partially mediates the relationships between teacher support and academic performance, and between parental support and academic performance, indicating that external support improves outcomes partly by strengthening students' behavioural, emotional, and cognitive engagement in learning. Overall, the findings highlight learning engagement as a practical lever for enhancing performance in higher vocational education. Findings suggest strengthening home-school collaboration and implementing engagement-focused teaching strategies (e.g., supportive classroom interactions and autonomy-supportive practices) to increase learning engagement and improve academic performance.

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1. INTRODUCTION

Higher vocational colleges in China play a key role in developing technical and professional skills aligned with labour market needs [1], [2]. In recent decades, vocational education has been strengthened through policy initiatives such as the National Implementation Plan for Vocational Education Reform, which aims to improve educational quality and system adaptability [3]–[5]. These reforms have promoted curriculum modernisation, closer alignment with industry needs, and teaching innovations. Despite these efforts, academic performance in higher vocational colleges remain uneven, and effective ways to support students' learning processes are still not fully understood [6], [7].

A major gap concerns the combined influence of school- and home-based support systems. Few studies in Chinese higher vocational colleges have investigated the combined effects of teacher and parental

support on academic performance through learning engagement. Existing studies often focus on other educational levels or examine teacher support and parental support separately, which may not reflect the learning profiles and institutional realities of vocational colleges. As a result, it remains unclear whether learning engagement functions as a shared mechanism through which both teacher and parental support contribute to vocational college students' academic performance.

This gap is important because higher vocational college students often face distinctive learning challenges. Many students enter with weaker academic foundations and varying levels of learning readiness, and some may lack clear learning goals, exhibit low engagement, or experience academic burnout [8]–[11]. These features increase the importance of supportive relationships that can stabilise motivation and sustain learning participation. In vocational colleges, teachers not only deliver knowledge and skills but also guide learning routines and shape students' professional awareness [12], [13]. Although higher vocational college students are typically regarded as adults, parents can continue to influence their learning outcomes through emotional encouragement, expectations, value guidance, and the provision of practical resources [14]–[18]. Understanding how teacher support and parental support work together is therefore essential for enhancing learning quality and academic performance within vocational education settings.

The present study is grounded in three complementary theoretical perspectives. Social support theory suggests that supportive actions provide emotional and instrumental resources that help students cope with academic demands and persist in learning tasks [19]. Self-determination theory proposes that support from significant others can satisfy students' psychological needs for autonomy, competence, and belonging, thereby strengthening internal drive and promoting more active participation in learning [20]. Engagement theory conceptualises learning engagement as students' behavioural, emotional, and cognitive involvement in learning activities, and argues that support influences learning outcomes primarily when it is translated into sustained engagement [21]–[23]. Collectively, these theories suggest that external support enhances academic performance primarily through increased learning engagement, while also allowing for direct effects of support on performance.

Building on this theoretical logic and addressing the research gap, this study investigates the effects of teacher support and parental support on academic performance among students in higher vocational colleges in Shandong Province, China, with learning engagement as the mediating mechanism. Learning engagement is selected because it captures students' ongoing involvement in learning across behavioural, emotional, and cognitive dimensions, providing a direct link between supportive inputs and academic outcomes. Accordingly, this study proposes the hypotheses: i) H1: teacher support has a positive effect on students' academic performance; ii) H2: parental support has a positive effect on students' academic performance; iii) H3: learning engagement significantly mediates the relationship between teacher support and academic performance; and iv) H4: learning engagement significantly mediates the relationship between parental support and academic performance.

2. METHOD

2.1. Sample

This study surveyed second-year students across diverse disciplines from three higher vocational colleges in Shandong Province, China. Second-year students were selected as participants because, compared with first-year students who are still adjusting to college life and third-year students who are typically off campus for internships [24], they are more adapted to campus routines and academic expectations. Therefore, their perceptions of teacher support, parental support, and learning engagement are more stable and can provide more reliable responses.

A total of 450 questionnaires were distributed, and 360 valid responses were retained for analysis after excluding incomplete or invalid submissions. As summarised in Table 1, the sample comprised 192 males and 168 females, predominantly aged 18–23, which aligns with the typical age profile of higher vocational college students. Participants represented various academic disciplines; 190 held urban household registration and 170 held rural registration. Nearly all participants lived on campus, which reflects typical arrangements for higher vocational colleges in China. In terms of parental education, the majority had attained education levels ranging from primary school or below to an associate degree, while fewer than 10% held a bachelor's degree or higher.

2.2. Measures and instrument adaptation

All constructs were measured using previously validated instruments. To tailor the measures to the higher vocational education context, item wording was reviewed and slightly modified to fit vocational college learning and teacher-student interaction settings (e.g., referring to vocational courses, skills-based learning tasks, and typical classroom practices), while retaining the original construct meanings and factor structures reported in prior research. All items were reviewed by experts to ensure content validity and contextual suitability. Internal consistency for each multi-item scale was reported using Cronbach's alpha.

Table 1. Demographic information of participants (N=360)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	192	53.33%
	Female	168	46.67%
Age	18-20	217	60.28%
	21-23	132	36.67%
	Above 23	11	3.05%
Household registration type	Urban	190	52.78%
	Rural	170	47.22%
Field of study	Education and humanities	64	17.78%
	Business and management	90	25.00%
	Science and engineering	97	26.95%
	Information technology	75	20.83%
	Arts and design	34	9.44%
Campus residence	On-campus	352	97.78%
	Off-campus	8	2.22%
Father's education	Primary school or below	74	20.56%
	Junior secondary school	108	30.00%
	Senior secondary school	74	20.56%
	Associate degree	82	22.77%
	Bachelor's degree	17	4.72%
Mother's education	Master's degree or higher	5	1.39%
	Primary school or below	91	25.28%
	Junior secondary school	104	28.89%
	Senior secondary school	70	19.44%
	Associate degree	63	17.50%
	Bachelor's degree	30	8.33%
	Master's degree or higher	2	0.56%

2.2.1. Teacher support

Teacher support was evaluated using an 18-item scale adapted from established instruments [25], [26]. It assesses three support aspects: emotional support (e.g., care, respect, and understanding), instructional support (e.g., clear explanations, guidance, and feedback), and motivational encouragement (e.g., fostering confidence and persistence). Responses were rated on a five-point Likert scale (1=strongly disagree to 5=strongly agree). The instrument exhibited high internal reliability (Cronbach's alpha=0.916).

2.2.2. Parental support

Parental support was assessed using an 18-item scale based on validated measures [27]–[30]. Items cover emotional warmth, practical support, and encouragement for learning and academic planning. Participants responded on a five-point scale, with higher scores indicating stronger perceived parental support. The scale exhibited good reliability, with a Cronbach's alpha of 0.878.

2.2.3. Learning engagement

Learning engagement was measured with a 15-item instrument grounded in the multidimensional view of engagement [21]. Items were adapted from prior studies supporting its three-factor structure [25], [31], [32]. The instrument assesses behavioural engagement (e.g., effort, attention, participation), cognitive engagement (e.g., learning strategies, deep processing, reflection), and emotional engagement (e.g., interest, enjoyment, attachment). Respondents rated frequency on a five-point Likert scale (1=never to 5=always). The scale showed good reliability (Cronbach's alpha=0.890).

2.2.4. Academic performance

In China's higher vocational education system, academic performance is commonly reported as an average numerical score (0-100) rather than a grade point average (GPA)-based system. Consistent with prior research [33]–[36], academic performance was measured using a single self-reported item: "What was your overall average mark in the last semester?" (Participants entered a number between 0 and 100).

2.3. Procedure

Data were collected using an online questionnaire distributed via the Wenjuanxing platform. Questionnaires were distributed through shared links and QR codes. Prior to data collection, participants were informed about the purpose, procedures, and data usage in this study. Upon accessing the link or scanning the QR code, participants were first directed to an electronic informed consent page, which explicitly stated that participation was completely voluntary. To proceed with the survey, participants were instructed to read the informed consent information and confirm their agreement by clicking the [agree and

continue] button. They were assured of their right to withdraw at any time without adverse consequences. Anonymity was strictly guaranteed, as the study did not collect any personally identifiable information (e.g., names or student IDs). The entire procedure was conducted in full compliance with ethical guidelines for research involving human participants.

2.4. Data analysis

Data analysis was performed using IBM SPSS Statistics 27.0 and PROCESS macro 5.0. First, descriptive statistics were calculated to summarise participants' demographic characteristics and the distributions of all study variables, and data normality was assessed to ensure the appropriateness of subsequent analyses. Second, Pearson correlations were used to examine the relationships among the key variables and to assess multicollinearity. Third, multiple regression analyses were performed to preliminarily assess the unique contributions of teacher and parental support to students' academic performance, while evaluating model fit and conducting residual diagnostics. Finally, the mediation model was tested using PROCESS (Model 4) [37], estimating two single-mediator models: support predicting performance via engagement, with covariates included. Bootstrapping with 5,000 resamples was conducted to test the indirect effects, and statistical significance was determined if the 95% confidence intervals did not include zero.

3. RESULTS AND DISCUSSION

3.1. Descriptive analysis

Descriptive statistics were calculated for 360 valid responses. As shown in Table 2, perceived teacher support, parental support, and learning engagement all fell within the moderate range [38], indicating generally positive but not uniformly strong perceptions among students. Interestingly, academic performance was relatively high ($M=75.26$ on a 0-100 scale), well above the passing threshold of 60 [39]. This discrepancy, moderate support and engagement alongside above-average performance raise an important question about the factors underlying such an outcome.

One possible interpretation is that academic performance in this context may be partially sustained by structured assessment practices, course requirements, or institutional performance norms that help students achieve passing outcomes even without high levels of perceived support or engagement [40], [41]. However, this contrast also suggests that academic performance alone may not fully capture the quality of learning. From an educational improvement perspective, the moderate levels of support and engagement indicate substantial room to strengthen the learning process and student experience. Enhancing these factors remains crucial for fostering deeper learning, reducing burnout, and improving long-term developmental outcomes, such as academic persistence and professional readiness, that extend beyond course scores [42]–[44].

Table 2. Descriptive statistics of study variables

Variables	Minimum	Maximum	Mean (M)	Standard deviations
Teacher support	1.00	5.00	3.26	1.03
Parental support	1.28	5.00	3.57	0.84
Learning engagement	1.27	5.00	3.24	0.98
Academic performance	56.00	92.00	75.26	8.14

3.2. Normality test

Before conducting regression and mediation analyses, this study first evaluated the normality of the key variables to ensure the data complied with the fundamental assumptions of multivariate analysis. Significant deviations from normality could compromise the accuracy of parameter estimates and the trustworthiness of statistical conclusions [45]. According to previous study [46], for small sample sizes, absolute skewness and kurtosis should not exceed 1.96; for larger samples (200 or more), they should be below 2.58. As shown in Table 3, all variables in this study had absolute skewness and kurtosis values under 2.58, indicating that the distributions were not highly skewed or overly kurtotic, demonstrating generally good normality.

Table 3. Normality test: skewness and kurtosis statistics

Variables	Skewness		Kurtosis	
	Statistics	Standard error	Statistics	Standard error
Teacher support	-0.193	0.129	-1.246	0.256
Parental support	-0.498	0.129	-0.451	0.256
Learning engagement	-0.011	0.129	-1.231	0.256
Academic performance	-0.266	0.129	-0.665	0.256

3.3. Pearson correlation analysis

As shown in Table 4, teacher support, parental support, learning engagement, and academic performance were all positively correlated. Teacher support had the strongest correlation with learning engagement, highlighting the central role of classroom relationships in shaping students' active participation in learning. This pattern is consistent with social support theory: proximal support within the learning environment can serve as a resource that encourages persistence and engagement in academic tasks [19], [47]. It also aligns with engagement theory, which emphasises that external support contributes to outcomes primarily when it becomes visible in students' behavioural, emotional, and cognitive participation in learning [21], [23], [47].

Parental support was also strongly associated with learning engagement and academic performance, suggesting that families remain an influential support system even at the higher vocational stage. This is consistent with evidence that parental emotional warmth, encouragement, and practical resources can sustain motivation and resilience when students face academic demands [15], [18]. These findings collectively underscore that the transition to higher vocational education represents not a separation from, but a continuation of, the family's critical role in fostering student success.

Table 4. Pearson correlations among study variables

Variables	1	2	3	4
Teacher support	1.00			
Parental support	0.750**	1.00		
Learning engagement	0.754**	0.698**	1.00	
Academic performance	0.747**	0.706**	0.713**	1.00

Note: **p<0.01.

3.4. Regression analysis

A regression analysis was employed to test the linear relationships between the predictor variables and academic performance, and to preliminarily assess the unique contribution of each independent variable [48]. As presented in Table 5, the overall model was highly significant ($F=206.088$, $p<0.001$) and accounted for 63.5% of the variance in academic performance. The close alignment of R^2 and adjusted R^2 suggests that the model is stable and not overfitted. Collinearity diagnostics indicated that all tolerance values were above 0.20 and variance inflation factor (VIF) values were below 3.3, suggesting minimal multicollinearity among the predictors [49].

Regarding the specific predictors, the results revealed that teacher support, parental support, and learning engagement each contributed positively and significantly to academic performance when considered simultaneously. This finding suggests that vocational college students' academic performance is linked not only to what happens in the classroom (teacher support and learning engagement) but also to the continuing influence of home-based support. In line with self-determination theory, supportive teaching practices are likely to strengthen students' competence and autonomy, thereby promoting more active learning involvement and better outcomes [20], [50]. Likewise, parental support may provide a stable motivational foundation that sustains learning effort and persistence over time [15].

Table 5. Regression analysis of study variables

Model	Unstandardised Coefficients		Standardised coefficients		Collinearity statistics		
	b	Standard error	β	t	p	Tolerance	VIF
1(Constant)	50.237	1.143		43.962	< 0.001		
Teacher support	2.801	0.438	0.354	6.398	< 0.001	0.334	2.990
Parental support	2.435	0.491	0.252	4.957	< 0.001	0.397	2.521
Learning engagement	2.231	0.424	0.269	5.261	< 0.001	0.391	2.555

$R = 0.797^a$ $R^2 = 0.635$ Adjusted $R^2 = 0.632$ $F = 206.088^{***}$ Durbin-Watson = 1.905

Note: ***p<0.001; dependent variable: academic performance.

3.5. Mediating role of learning engagement

To examine the mediating role of learning engagement, two separate single-mediator models were tested using Hayes' [37] PROCESS Macro-Model 4. As shown in Table 6, both teacher support and parental support exerted significant direct positive effects on academic performance after controlling for covariates. These results indicate that higher levels of perceived support from teachers and parents are directly associated with better academic performance among higher vocational college students, thereby supporting hypotheses 1 and 2.

The significant direct effects observed in this study reinforce the view that support systems remain central for vocational college students, who often face weaker academic foundations and less stable learning motivation [11]. Within the context of vocational education, teachers function not only as knowledge transmitters but also as key guides who shape learning norms and daily academic routines [51]. Supportive teacher-student relationships can thus strengthen students' confidence, persistence, and willingness to invest effort in learning tasks [13], [35]. Importantly, the results also demonstrate that parental support continues to play a significant role even at the higher vocational stage. Rather than direct academic supervision, parental support in this context appears to operate primarily through emotional encouragement, value guidance, and practical resources that help students sustain motivation and navigate their learning and career development pathways [15]–[17], [52]. Taken together, these findings suggest that school- and home-based support play complementary roles in promoting academic performance among higher vocational college students [53].

A subsequent mediation analysis was conducted to assess the indirect effects. As presented in Table 7, the decomposition of total, direct, and indirect effects indicated that learning engagement partially mediated the effects of both teacher support and parental support on academic performance, thus supporting hypotheses 3 and 4. These results align with the integrated model proposed in this study: teacher and parental support promote academic performance through dual pathways indirectly by fostering learning engagement, and directly through unique effects not fully explained by learning engagement. The mediating pathways are illustrated in Figure 1. This pattern is consistent with engagement theory [21], which posits that external support influences learning outcomes primarily when it is internalised into students' behavioural participation, emotional involvement, and cognitive investment in learning [23], [47]. In vocational education, such multidimensional engagement is particularly important, as it supports both conceptual understanding and skills practice, while also contributing to professional identity development and employability-related competencies [26], [27], [54], [55].

Table 6. Regression coefficients for the mediation model

Independent variables	Dependent variable			
	Learning engagement		Academic performance	
	b	t	b	t
Teacher support	0.466	9.347***	2.526	5.777***
Learning engagement	-	-	1.953	4.660***
Parental support	0.339	5.597***	2.389	4.815***
Gender	0.224	3.037**	2.204	3.763***
Age	-0.008	-0.136	0.889	1.922
Household registration type	0.099	1.358	0.227	0.399
Field of study	-0.001	-0.053	0.444	2.085*
Campus residence	0.121	0.539	0.668	0.379
Father's education	0.028	0.740	0.435	1.488
Mother's education	-0.009	-0.256	-0.054	-0.190
R ²	0.621		0.661	
F	63.647***		68.032***	

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

Table 7. Direct, indirect, and total effects of teacher support and parental support on academic performance

Predictor	Effect type	b	Standard error	95% LLCI	95% ULCI	% of total effect
Teacher support	Total effect (c)	3.436	0.502	2.085	4.809	100%
	Direct effect (c')	2.526	0.437	1.666	3.386	73.52%
	Indirect effect (a*b)	0.910	0.257	0.419	1.422	26.48%
Parental support	Total effect (c)	3.051	0.589	1.661	4.562	100%
	Direct effect (c')	2.389	0.496	1.413	3.364	78.30%
	Indirect effect (a*b)	0.662	0.252	0.252	1.221	21.70%

Note: LLCI=lower limit confidence interval and ULCI=upper limit confidence interval.

The observation that mediation is partial rather than full carries important practical implications. It suggests that teacher support and parental support can also influence academic performance through direct pathways beyond learning engagement, a finding that corroborates the direct effects reported above. For instance, teacher support can directly enhance academic performance by providing clearer instruction, more effective feedback, and structured guidance that helps students succeed in assessments. Consistent with self-determination theory, such support may also reduce academic anxiety and strengthen competence beliefs [20], [35], [50]. Similarly, parental support may exert direct effects by buffering stress, bolstering resilience, and offering stable emotional and material resources that help students maintain academic performance under pressure [15], [18], [52]. In essence, while learning engagement serves as a key mediating mechanism,

supportive relationships also contribute to academic performance through motivational stability and enhanced learning effectiveness—factors that may not be fully captured by learning engagement measures alone.

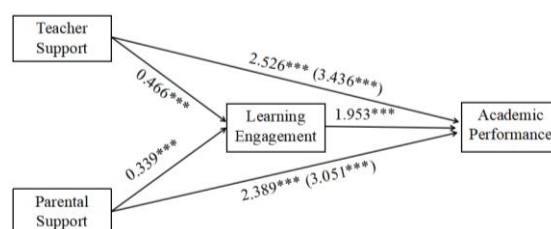


Figure 1. Pathways of the mediation model

3.6. Limitations and future research

Several limitations should be noted in the present study. First, the study was conducted in three higher vocational colleges within a single Chinese province, which may limit the generalisability of the findings across regions and institutional types. Future research could include institutions across multiple provinces and, where feasible, explore cross-national comparisons. Second, the cross-sectional nature limits causal interpretations of the relationships among support, learning engagement, and academic performance. Longitudinal studies are recommended to establish temporal precedence and to investigate how dynamic changes in perceived support and learning engagement predict academic performance over time. Third, this study did not incorporate other potentially relevant factors, such as individual psychological traits or contextual influences (e.g., peer support, school climate, and teaching resources). Future research is therefore encouraged to employ multi-level analyses that integrate these factors to better explain the variations in learning engagement and academic performance among higher vocational college students.

4. CONCLUSION

Integrating social support theory, self-determination theory, and engagement theory, this study found that teacher and parental support were positively associated with academic performance among students in Chinese higher vocational colleges, with learning engagement partially mediating these relationships. These findings suggest that enhancing students' academic performance requires not only strengthening support from both school and family but also promoting their behavioural, emotional, and cognitive engagement in learning. In light of these results, targeted educational practices and supportive policies should be implemented to foster students' academic development and long-term learning outcomes.

In terms of practice, vocational colleges should strengthen teachers' capacity to provide both instructional and emotional support. Instructionally, teachers can improve learning effectiveness through clear explanations, timely feedback, and structured guidance that helps students meet course expectations. Emotionally, teachers can build students' confidence by offering encouragement and addressing learning difficulties, which is particularly important for those with weaker academic foundations. Meanwhile, institutions should promote structured parental involvement that fits the higher vocational context. Parents can support students by providing motivational encouragement, emotional reassurance, value guidance, and practical assistance with study habits and career planning. Regular family engagement activities can strengthen home-school consistency and foster collaborative platforms for shared problem-solving, turning partnership principles into concrete practice. These joint efforts from teachers and parents may generate a positive feedback loop, in which greater support enhances learning engagement and ultimately improves academic performance.

Given that learning engagement was found to play a partial mediating role in this study, targeted engagement-focused interventions should be adopted alongside external support to foster students' multidimensional engagement in the learning process. Approaches such as project-based learning, peer collaboration, interactive classroom activities, and encouraging reflective practices can enhance students' active participation, strengthen their learning interest and commitment, and facilitate deeper processing of course content. In addition, formative assessment can further sustain engagement by establishing clear learning objectives, offering continuous feedback, and providing opportunities for improvement. Through comprehensive and effective engagement in learning, students are better able to internalise external support and translate it into improved academic outcomes.

At the policy level, these recommendations align with China's vocational education reform goals that emphasise improving educational quality, strengthening system adaptability, and enhancing the alignment

between talent training and labour-market needs. Policies that support teachers’ professional development in engagement-oriented pedagogy, encourage parent-institution partnerships, and promote scalable home–school collaboration models can help vocational colleges translate reform priorities into tangible classroom-level improvements. Furthermore, establishing monitoring frameworks to evaluate the effects of support- and engagement-based interventions can facilitate continuous quality improvement across institutions.

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- C : Conceptualization
- M : Methodology
- So : Software
- Va : Validation
- Fo : Formal analysis
- I : Investigation
- R : Resources
- D : Data Curation
- O : Writing - Original Draft
- E : Writing - Review & Editing
- Vi : Visualization
- Su : Supervision
- P : Project administration
- Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The study adhered to all relevant national regulations and institutional policies in accordance with the principles of the Helsinki Declaration, and has been approved by the Ethics Committee of University Utara Malaysia (Approval No. UUM/CAS/AHSGS/E-5).

DATA AVAILABILITY

The data that support the findings of this study are openly available in Zenodo at <https://doi.org/10.5281/zenodo.18162280>.

REFERENCES

[1] X. Yang, “Evaluation on the training effect of applied talents in higher vocational colleges under the background of regional economy,” *Mathematical Problems in Engineering*, vol. 2022, 2022, doi: 10.1155/2022/8631696.

[2] H. Zhang, “The intrinsic logic and practical pathways of empowering vocational education through industry-education integration,” *World Vocational and Technical Education*, vol. 1, no. 1, pp. 38–54, 2025, doi: 10.1515/wvte-2025-2001.

[3] P. Chen, C. Schmidtke, and X. Jin, “Chinese technical and vocational education and training, skill formation, and national development: A systematic review of educational policies,” *Vocation, Technology & Education*, vol. 1, no. 3, 2024, doi: 10.54844/vte.2024.0677.

[4] S. Liu and I. Hardy, “Understanding Chinese national vocational education reform: a critical policy analysis,” *Journal of Vocational Education & Training*, vol. 75, no. 5, pp. 1055–1077, 2021, doi: 10.1080/13636820.2021.1998195.

[5] X. Jin, N. Zhou, and X. Zhang, “China’s policy intention regarding the vocational education-industry relationship: a systematic policy review,” *Education+ Training*, vol. 67, no. 5-6, pp. 1–16, 2025, doi: 10.1108/ET-04-2024-0169.

- [6] Z. Liu, R. Hordósy, and V. Wedekind, "How Chinese higher vocational education and training (HVET) students determine their post-college pathway in the post-COVID 19 era," *International Journal for Research in Vocational Education and Training*, vol. 13, no. 1, pp. 126–157, 2026, doi: 10.13152/IJRVET.13.1.6.
- [7] Y. Han, R. Ni, Y. Deng, and Y. Zhu, "Supply and demand of higher vocational education in China: comprehensive evaluation and geographical representation from the perspective of educational equality," *PLoS ONE*, vol. 18, no. 10, 2023, doi: 10.1371/journal.pone.0293132.
- [8] Z. Liu, "China's higher vocational education and training (HVET) graduates' soft-skill gap: individual aspirations and structural constraints," *Research in Post-Compulsory Education*, vol. 30, no. 4, pp. 698–722, 2025, doi: 10.1080/13596748.2025.2550847.
- [9] Y. Gao and S. H. Mohamad, "Unraveling the learning behaviors of chinese private college students and effective guiding strategies," *Nusantara Journal of Behavioral and Social Science*, vol. 4, no. 1, pp. 9–22, 2025, doi: 10.47679/njbss.202574.
- [10] X. Xu, Z. Wu, and D. Wei, "The relationship between perceived teacher support and student engagement among higher vocational students: A moderated mediation model," *Frontiers in Psychology*, vol. 14, p. 1116932, 2023, doi: 10.3389/fpsyg.2023.1116932.
- [11] Q. Gao and M. Mohamad, "A conceptual model of learning adaptability of higher vocational students in China," *Asia-Pacific Education Researcher*, vol. 34, no. 3, pp. 1063–1075, 2025, doi: 10.1007/s40299-024-00921-7.
- [12] L. Zhang and Y. Zhang, "Exploring the pathways of vocational mission education for college students in the new era," *Advances in Humanities and Modern Education Research*, vol. 2, no. 1, p. 1, 2025, doi: 10.70114/ahmer.2025.2.1.p1.
- [13] H. Ouyang and K. T. Wong, "Perceived teacher support and academic achievement in higher education: a systematic literature review," *Open Education Studies*, vol. 7, no. 1, 2025, doi: 10.1515/edu-2025-0111.
- [14] Y. Liu and S. Lee, "The interplay of social support and vocational education perceptions on academic motivation: insights from Chinese vocational college," *International Journal of Academic Research in Progressive Education and Development*, vol. 14, no. 4, 2025, doi: 10.6007/ijarped/v14-i4/27065.
- [15] L. M. Boonk, H. J. M. Gijsselaers, H. Ritzen, and S. Brand-Gruwel, "Student-perceived parental involvement as a predictor for academic motivation in vocational education and training (VET)," *Journal of Vocational Education and Training*, vol. 74, no. 2, pp. 187–209, 2022, doi: 10.1080/13636820.2020.1745260.
- [16] E. Wang, S. Li, Y. Jiang, and J. Zhang, "Longitudinal effect of career-related parental support on vocational college students' proactive career behavior: a moderated mediation model," *Current Psychology*, vol. 43, no. 13, 2024, doi: 10.1007/s12144-023-05268-8.
- [17] H. Wang, J. Liu, C. Li, A. Fang, and G. Wang, "Research on the effect mechanism of career-specific parental support promoting meaning in life of Chinese higher vocational college students," *Behavioral Sciences*, vol. 14, no. 12, 2024, doi: 10.3390/bs14121172.
- [18] B. Ye, S. Zhao, Y. Zeng, C. Chen, and Y. Zhang, "Perceived parental support and college students' depressive symptoms during the COVID-19 pandemic: the mediating roles of emotion regulation strategies and resilience," *Current Psychology*, vol. 42, no. 23, pp. 20275–20286, 2023, doi: 10.1007/s12144-022-03049-3.
- [19] M. S. Rodriguez and S. Cohen, "Social support," *Encyclopedia of Mental Health*, vol. 3, no. 2, pp. 535–544, 1998.
- [20] E. L. Deci and R. M. Ryan, "The 'what' and 'why' of goal pursuits: human needs and the self-determination of behavior," *Psychological Inquiry*, vol. 11, no. 4, pp. 227–268, 2000, doi: 10.1207/S15327965PLI1104_01.
- [21] P. C. Blumenfeld, A. H. Paris, and J. A. Fredricks, "School engagement: potential of the concept, state of the evidence," *Review of Educational Research*, vol. 74, no. 1, pp. 59–109, 2004.
- [22] Q. Luo, L. Chen, and K. Zhang, "The mediating role of learning engagement between self-efficacy and academic achievement among Chinese college students," *Psychology Research and Behavior Management*, vol. 1, no. 1, 2022, doi: 10.2147/PRBM.S401145.
- [23] J. Yan, L. Shi, and C. K. Tan, "The interrelationship of behavioural, emotional, and cognitive classroom engagement in higher education: understanding the mechanisms of student success," *International Journal of Continuing Engineering Education and Life-Long Learning*, vol. 1, no. 1, 2025, doi: 10.1504/ijceell.2025.10072789.
- [24] Y. Zhang and M. D. Kasa, "Effect of peer support on academic performance among higher vocational college students: the parallel mediating roles of learning engagement and achievement goals," *International Journal of Educational Psychology*, vol. 15, no. 2, pp. 103–123, 2026, doi: 10.17583/ijep.19268.
- [25] M. Zhang, "The effect of teacher support on high school students' engagement in English writing," (in Chinese), M.S. thesis, Qufu Normal University, Qufu, Shandong, China, 2025, doi: 10.27267/d.cnki.gqfsu.2025.000600.
- [26] J. Wu, Z. Yan, Y. Yang, J. Zhu, Y. Xiong, and J. Chen, "The perceived teacher support scale (PTSS) for students: Development and psychometric studies," *International Journal of Educational Research*, vol. 128, 2024, doi: 10.1016/j.ijer.2024.102487.
- [27] C. Kerres Malecki and M. Kilpatrick Demaray, "Measuring perceived social support: development of the child and adolescent social support scale (CASSS)," *Psychology in the Schools*, vol. 39, no. 1, pp. 1–18, 2002.
- [28] K. F. Huang, "The influence of vocational school students' career exploration on future work-self: the partial mediating role of career-related parental support," (in Chinese), M.S. thesis, Kashgar University, Kashgar, Xinjiang, China, 2025, doi: 10.27746/d.cnki.gkssf.2025.000340.
- [29] J. Zhang, G. Chen, and M. Yuen, "Validation of the career-related parental support scale (Chinese version)," *The Counseling Psychologist*, vol. 47, no. 3, pp. 417–443, Apr. 2019, doi: 10.1177/0011000019873235.
- [30] C. J. Sun, "The effect of parental support on learning engagement in junior high school students: the role and intervention of self-control and academic procrastination," (in Chinese), M.S. thesis, Gannan Normal University, Ganzhou, Jiangxi, China, 2024, doi: 10.27685/d.cnki.ggnsf.2024.000557.
- [31] M. X. Liang, "A study on the sinicization of the self-regulated learning strategies scale for undergraduate nursing students and its application," (in Chinese), M.S. thesis, Yangzhou University, Yangzhou, Jiangsu, China, 2025, doi: 10.27441/d.cnki.gyzdu.2025.002243.
- [32] N. N. Liu, "An empirical study on the promotion of conversational peer feedback to college students learning engagement," (in Chinese), M.S. thesis, Zhejiang Normal University, Jinhua, Zhejiang, China, 2024, doi: 10.27464/d.cnki.gzsfu.2024.000026.
- [33] S. D. Brown, R. W. Lent, and K. C. Larkin, "Self-efficacy as a moderator of scholastic aptitude-academic performance relationships," *Journal of Vocational Behavior*, vol. 35, no. 1, pp. 64–75, 1989, doi: 10.1016/0001-8791(89)90048-1.
- [34] H. J. Yang, "Factors affecting student burnout and academic achievement in multiple enrollment programs in Taiwan's technical-vocational colleges," *International Journal of Educational Development*, vol. 24, no. 3, 2004, doi: 10.1016/j.ijedudev.2003.12.001.
- [35] J. M. Muola, R. Maithya, and A. M. Mwinzi, "The effect of academic advising on academic performance of university students in Kenyan universities," *African Research Review*, vol. 5, no. 5, pp. 332–345, 2011, doi: 10.4314/afrev.v5i5.26.
- [36] N. L. Higgins, J. A. Rathner, and S. Frankland, "Development of self-regulated learning: a longitudinal study on academic performance in undergraduate science," *Research in Science and Technological Education*, vol. 41, no. 4, pp. 1242–1266, 2023, doi: 10.1080/02635143.2021.1997978.
- [37] A. F. Hayes, "Counterfactual/potential outcomes "causal mediation analysis" with treatment by mediator interaction using PROCESS," *Canadian Centre for Research Analysis and Methods Technical Report*, pp. 1–12, 2022.

- [38] D. Sharif, K. A. Meerangani, M. S. Hassan, M. F. A. Hamid, A. Q. A. Razak, and M. M. Noor, "Impact race factor on the tolerance of a multicultural society in Malaysia," in *Proceedings of the International Conference on Sustainable Practices, Development and Urbanisation (IConsPADU 2021)*, 16 November 2021, Universiti Selangor (UNISEL), Malaysia, vol. 3, pp. 425–437, 2022, doi: 10.15405/epms.2022.10.42.
- [39] X. Lin, P. Lei, Q. Tan, and B. Xiong, "Culture, goal orientation and achievement of vocational college students," *Frontiers in Psychology*, vol. 16, 2025, doi: 10.3389/fpsyg.2025.1639938.
- [40] D. R. Sadler, "Three in-course assessment reforms to improve higher education learning outcomes," *Assessment and Evaluation in Higher Education*, vol. 41, no. 7, pp. 1081–1099, 2016, doi: 10.1080/02602938.2015.1064858.
- [41] S. Batool, J. Rashid, M. W. Nisar, J. Kim, H. Y. Kwon, and A. Hussain, "Educational data mining to predict students' academic performance: a survey study," *Education and Information Technologies*, vol. 28, no. 1, 2023, doi: 10.1007/s10639-022-11152-y.
- [42] L. Tao, "Improving the quality of vocational education in higher vocational colleges based on deep learning technology: student learning prediction and personalized recommendation," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, vol. 29, no. 2, pp. 407–416, 2025, doi: 10.20965/jaciii.2025.p0407.
- [43] L. Lanxin and N. B. Rahim, "Review report on vocational college students' research," *International Journal of Academic Research in Progressive Education and Development*, vol. 14, no. 3, 2025, doi: 10.6007/ijarped/v14-i3/26037.
- [44] R. Q. G. Rashed, A. A. Abubakar, O. Madani, and Y. H. Al-Mamary, "Enhancing student engagement and motivation for sustainable education: the role of internship and institutional support," *Sustainability (Switzerland)*, vol. 17, no. 12, 2025, doi: 10.3390/su17125291.
- [45] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Canonical correlation: a supplement to multivariate data analysis in Multivariate data analysis: a global perspective*. 7th ed., New York: Pearson, 2010.
- [46] M. E. E. M. Matore and A. Z. Khairani, "The pattern of Skewness and Kurtosis using mean score and logit in measuring adversity quotient (AQ) for normality testing," *International Journal of Future Generation Communication and Networking*, vol. 13, no. 1, pp. 688–702, 2020.
- [47] X. Zhang and W. Qian, "The effect of social support on academic performance among adolescents: the chain mediating roles of self-efficacy and learning engagement," *PLoS ONE*, vol. 19, no. 12, 2024, doi: 10.1371/journal.pone.0311597.
- [48] A. Field, *Discovering statistics using IBM SPSS statistics*. London: Sage Publication Limited, 2024.
- [49] R. M. O'Brien, "A caution regarding rules of thumb for variance inflation factors," *Quality and Quantity*, vol. 41, no. 5, pp. 673–690, 2007, doi: 10.1007/s11135-006-9018-6.
- [50] K. H. Siacor, B. Ng, and W. C. Liu, "Fostering student motivation and engagement through teacher autonomy support: a self-determination theory perspective," *International Journal of Instruction*, vol. 17, no. 2, 2024, doi: 10.29333/iji.2024.17232a.
- [51] M. Lensjø and S. Billett, "Constructing vocational educators' practices: a narrative and ethnographic study," *Journal of Vocational Education & Training*, pp. 1–20, 2026, doi: 10.1080/13636820.2026.2654088.
- [52] Z. Yaying and W. H. Suan, "The influence of parental support on academic achievement among vocational college students in Ganzhou, China: a mediating effect of teacher's teaching style," *International Journal of Academic Research in Business and Social Sciences*, vol. 14, no. 10, 2024, doi: 10.6007/ijarbs/v14-i10/23229.
- [53] C. M. McWayne, G. Melzi, and J. Mistry, "A home-to-school approach for promoting culturally inclusive family-school partnership research and practice," *Educational Psychologist*, vol. 57, no. 4, pp. 238–251, 2022, doi: 10.1080/00461520.2022.2070752.
- [54] X. Zhou, "A conceptual review of the effectiveness of flipped learning in vocational learners' cognitive skills and emotional states," *Frontiers in Psychology*, vol. 13, 2023, doi: 10.3389/fpsyg.2022.1039025.
- [55] I. Zitha, G. Mokganya, and O. Sinthumule, "Innovative strategies for fostering student engagement and collaborative learning among extended curriculum programme students," *Education Sciences*, vol. 13, no. 12, 2023, doi: 10.3390/educsci13121196.

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