International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

The Relationship Between Carrer Calling and Learning Engagement Among Medical Students

Zengli Zou[1], Yue Dou[2]

[1]Student, Institute of Arts and Sciences, Far Eastern University
[2]Student, Graduate School, Guangxi University of Chinese Medicine

Abstract:
Objective: To explore the relationship between medical students' career calling and learning engagement.
Methods: A convenience sampling survey was conducted on medical students from one medical college in Guangxi Zhuang Autonomous Region and one in Hunan Province, People's Republic of China, using the Career Calling Scale and the Learning Engagement Scale.
Results: The total score of career calling and its dimensions were significantly positively correlated with the total score of learning engagement and its dimensions. After controlling for relevant demographic variables, regression analysis showed that career calling significantly and positively predicted learning engagement. Among the dimensions, guiding force showed the strongest predictive effect, followed by altruistic contribution, whereas meaning and value demonstrated relatively lower explanatory power.
Conclusion: Career calling is an important factor influencing medical students' learning engagement. Enhancing medical students' career calling may help promote higher levels of learning engagement.

Keywords: Medical Students; Carrer Calling; Learning Engagement

1. Introduction

Learning engagement is widely recognized as a key determinant of students' learning quality, professional development, and psychological well-being. In medical-related programs, sustaining continuous and focused learning engagement is particularly challenging due to the rigorous curriculum requirements, prolonged training duration, and substantial clinical practice pressures. Medical students face greater academic stress and psychological burden than their peers in other disciplines, driven not only by heavy course loads and clinical demands, but also by concerns about professional identity and future career prospects (Boone et al., 2025). Given that medical education bears the crucial mission of cultivating high-quality professionals for national health services, enhancing medical students' learning engagement is of great significance.

Learning engagement is a positive, fulfilling psychological state characterized by vigor, dedication, and absorption (Schaufeli et al., 2002). It is a persistent affective-cognitive state, not focused on any particular object, event, or behavior. Vigor refers to high levels of energy and mental resilience; dedication involves strong involvement accompanied by a sense of significance, enthusiasm, and challenge; absorption is characterized by full concentration in which time seems to pass quickly. Research indicates that learning engagement is malleable — it arises from the dynamic interaction between the individual and their environment, such that academic and social conditions can either foster or hinder it (Fredricks, Blumenfeld, & Paris, 2004).

Among the motivational variables that may influence learning engagement, carrer calling — a transcendent career orientation emphasizing purpose, meaning, and prosocial motivation — has attracted increasing scholarly attention. Dik and Duffy (2009) defined calling as a transcendent summons experienced as originating beyond the self, which orients individuals toward a particular life role in a way that derives purpose and meaningfulness, with other-oriented values and goals as primary sources of motivation. Research consistently links calling to positive vocational outcomes including work engagement, career commitment, and life satisfaction (Duffy & Dik, 2013). Similarly, students who perceive their career as a calling tend to view their current studies as an essential pathway toward their vocation, and therefore invest greater time and effort (Duffy & Sedlacek, 2007). Calling does not operate in isolation; it indirectly promotes learning by transforming individuals' cognitive and emotional states. Studies have found that calling enhances academic performance and engagement indirectly through strengthening career self-efficacy, and that it motivates vocational exploration behaviors, making the learning process more goal-directed (Taber & Blankemeyer, 2015).

Self-Determination Theory (SDT; Ryan & Deci, 2017) provides a theoretical foundation for understanding the relationship between carrer calling and learning engagement. SDT posits that intrinsic motivation — characterized by autonomy, competence, and relatedness — is fundamental to sustained engagement and well-being. When individuals lack intrinsic motivation, they self-regulate by actively seeking meaning and value in their work, thereby generating intrinsic motivation. Carrer calling, which resembles an individual's intrinsic work values and sense of meaning, is inherently autonomously driven and can stimulate individual autonomy, thus promoting work engagement (Elangovan, Pinder, & McLean, 2010). From a basic psychological needs perspective, SDT holds that satisfaction of the needs for autonomy, competence, and relatedness enhances feelings of meaning and value, which contributes to well-being (Gagné & Deci, 2005). Carrer calling, as a positive internal psychological construct, facilitates fulfillment of these needs and activates intrinsic work motivation.

Despite its theoretical and practical significance in medical education, empirical research on the relationship between carrer calling and learning engagement remains limited. Most prior research has focused on burnout as a negative indicator, with relatively insufficient attention to positive motivational antecedents of engagement. Therefore, the present study takes medical students as the study population to examine the relationship between carrer calling and learning engagement. The findings are expected to deepen theoretical understanding of motivational processes in health professions education and provide evidence-based intervention strategies to enhance learning engagement in medical training.

2. Methods

2.1 Participants

This study conducted a convenience sampling of medical students from one medical college in Guangxi Zhuang Autonomous Region and one in Hunan Province of the People's Republic of China. A total of 2224 questionnaires were distributed, and by excluding questionnaires with a response time of less than 120 seconds and selecting the same option, 1922 valid data were obtained, with an effective rate of 86.4%. The basic information of the research sample is shown in Table 1.

Table 1. Background Characteristics of the Study Sample (*N* = 1922)

Variable	Category	*n*	%
Gender	Male	536	27.9

	Female	1386	72.1
Hometown	Urban	553	28.77
	Rural	1369	71.23
Student Cadre Experience	Yes	1275	66.34
	No	647	33.66
Grade	Year 1	553	28.77
	Year 2	562	29.24
	Year 3	369	19.20
	Year 4+	438	22.79

2.2 Measures

2.2.1 Carrer calling Scale

The Chinese version of the Carrer calling Scale, adapted by Zhang Chunyu (2015) for use in Chinese cultural contexts, was employed. The scale comprises 11 items across three dimensions: altruistic contribution, orientation, and meaning and value. Items are rated on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree), with higher scores indicating stronger carrer calling. In this study, Cronbach's $\alpha = 0.918$, demonstrating good reliability.

2.2.2 Learning engagement Scale

The Learning Engagement Scale adapted by Li and Huang (2010) based on Schaufeli et al.'s (2003)original scale for use with Chinese students was adopted. The scale consists of 17 items covering three dimensions: motivation, energy, and concentration. Items are rated on a 7-point Likert scale, with higher scores reflecting higher levels of learning engagement. In this study, Cronbach's $\alpha = 0.964$, indicating excellent reliability.

2.3 Data Analysis

Statistical analyses were conducted using SPSS 25.0. Descriptive statistics, independent samples t-tests, one-way ANOVA, Pearson correlation analysis, and stepwise multiple regression analyses were performed.

3. Results

3.1 Descriptive Statistics

Descriptive statistics for carrer calling and learning engagement are presented in Table 2. All dimensional means of carrer calling exceeded the theoretical midpoint ($M > 3$), and all dimensional means of learning engagement exceeded the theoretical midpoint ($M > 4$).

Table 2. Total Scores and Dimensional Scores of Carrer calling and Learning engagement ($N = 1922$)

Variable	***M***	***SD***
Carrer Calling (Total)	3.66	0.66
Altruistic Contribution	3.80	0.70
Orientation	3.37	0.81

Meaning and Value	3.86	0.71
Learning Engagement (Total)	4.35	0.92
Motivation	4.61	0.93
Energy	4.14	1.00
Concentration	4.29	0.97

3.2 Group Difference Analyses

3.2.1 Gender Differences

Independent samples *t*-tests revealed no significant gender differences in the total scores or any dimensional scores of carrer calling or learning engagement (all *ps* > 0.05; see Table 3).

Table 3. Gender Differences in Carrer calling and Learning engagement (M ± SD)

Variable	**Male (*n* = 536)**	**Female (*n* = 1386)**	***t***
Carrer Calling (Total)	3.69 ± 0.71	3.65 ± 0.64	1.216
Altruistic Contribution	3.84 ± 0.73	3.78 ± 0.69	1.671
Orientation	3.42 ± 0.87	3.35 ± 0.79	1.510
Meaning and Value	3.86 ± 0.77	3.87 ± 0.69	-0.028
Learning Engagement (Total)	4.40 ± 0.96	4.33 ± 0.91	1.596
Motivation	4.65 ± 0.97	4.59 ± 0.92	1.322
Energy	4.19 ± 1.04	4.12 ± 0.99	1.384
Concentration	4.36 ± 1.00	4.27 ± 0.96	1.910

Note: * $p < 0.05$; ** $p < 0.01$; *** $p <0$ .001; same below.

3.2.2 Hometown Differences

Independent samples *t*-tests revealed a significant hometown difference only on the altruistic contribution dimension of carrer calling ($t = 2.040$, $p < 0.05$), with urban students scoring significantly higher than rural students. No significant differences were found on any other dimensions or on learning engagement (see Table 4).

Table 4. Hometown Differences in Carrer calling and Learning engagement (*M* ± *SD*)

Variable	**Urban (*n* = 553)**	**Rural (*n* = 1369)**	***t***
Carrer Calling (Total)	3.69 ± 0.64	3.65 ± 0.67	1.418
Altruistic Contribution	3.85 ± 0.68	3.78 ± 0.71	2.040*

Orientation	3.38 ± 0.82	3.36 ± 0.81	0.370
Meaning and Value	3.90 ± 0.70	3.85 ± 0.72	1.552
Learning Engagement (Total)	4.33 ± 0.96	4.36 ± 0.90	-0.521
Motivation	4.62 ± 0.99	4.61 ± 0.91	0.212
Energy	4.09 ± 1.05	4.16 ± 0.98	-1.304
Concentration	4.28 ± 0.99	4.30 ± 0.96	-0.311

3.2.3 Student Cadre Experience Differences

Students with student cadre experience scored significantly higher than those without on the total score and all dimensions of carrer calling (all *p*s < 0.001) and on the total score and all dimensions of learning engagement (all *p*s ≤ 0.01; see Table 5).

Table 5. Student Cadre Experience Differences in Carrer calling and Learning engagement (M ± SD)

Variable	**With Experience (*n* = 1275)**	**Without Experience (*n* = 647)**	***t***
Carrer Calling (Total)	3.72 ± 0.65	3.55 ± 0.66	5.434***
Altruistic Contribution	3.85 ± 0.69	3.70 ± 0.72	4.601***
Orientation	3.44 ± 0.80	3.23 ± 0.82	5.356***
Meaning and Value	3.91 ± 0.71	3.77 ± 0.71	4.164***
Learning Engagement (Total)	4.41 ± 0.92	4.24 ± 0.91	3.848***
Motivation	4.66 ± 0.93	4.51 ± 0.93	3.431**
Energy	4.20 ± 0.99	4.02 ± 1.01	3.820***
Concentration	4.35 ± 0.98	4.18 ± 0.95	3.719***

3.2.4 Grade Differences

One-way ANOVA revealed significant grade differences in carrer calling and learning engagement (all *p*s ≤ 0.05). Year 2 students consistently scored the lowest across nearly all variables, while Year 4+ students scored highest on most indicators (see Table 6).

Table 6. Grade Differences in Carrer calling and Learning engagement (M ± SD)

Variable	Year 1 (*n*=553)	Year 2 (*n*=562)	Year 3 (*n*=369)	Year 4+ (*n*=438)	F	Post Hoc
Carrer Calling (Total)	3.73±0.63	3.59±0.70	3.67±0.71	3.66±0.58	4.617*	1>2
Altruistic Contribution	3.87±0.68	3.72±0.75	3.81±0.74	3.80±0.64	4.201*	1>2
Orientation	3.46±0.77	3.31±0.83	3.40±0.84	3.30±0.82	4.255*	1>2,4
Meaning and Value	3.91±0.69	3.77±0.76	3.83±0.75	3.96±0.62	7.220***	1>2; 4>2,3
Learning Engagement (Total)	4.37±0.92	4.22±0.93	4.36±0.98	4.49±0.85	7.230***	1,3,4>2; 4>1,2,3
Motivation	4.64±0.94	4.49±0.96	4.55±0.97	4.76±0.84	7.424***	1>2; 4>1,2,3
Energy	4.16±0.99	3.99±1.00	4.19±1.06	4.26±0.95	6.560***	1,3,4>2
Concentration	4.28±0.96	4.17±0.96	4.32±1.03	4.44±0.92	6.911***	4>1,2; 3,1>2

Note: 1 = Year 1; 2 = Year 2; 3 = Year 3; 4 = Year 4+.

3.3 Correlation Analysis

Pearson correlation analyses revealed significant positive correlations between all dimensions of carrer calling and all dimensions of learning engagement (all *p*s < 0.01; see Table 7). These results support proceeding to regression analysis.

Table 7. Pearson Correlations Among All Variables

Variable	1	2	3	4	5	6	7
1. PC Total	1						
2. Altruistic	.892**	1					
3. Orientation	.880**	.625**	1				
4. Meaning	.873**	.753**	.633**	1			
5. AE Total	.509**	.443**	.462**	.438**	1		
6. Motivation	.509**	.464**	.429**	.459**	.936**	1	
7. Energy	.481**	.403**	.461**	.396**	.961**	.831**	1

8. Concentration	.459**	.394**	.423**	.391**	.956**	.837**	.902**

Note: PC = Carrer Calling; AE = Learning Engagement. ** $p < 0.01$.

3.4 Regression Analysis

As shown in Table 8, carrer calling total score significantly and positively predicted learning engagement ($\beta = 0.51$, $p < .001$), accounting for 26% of its variance. In the stepwise model (Model 2), all three dimensions entered the equation: orientation was the strongest predictor ($\beta = 0.27$, $\Delta R^2 = 0.21$), followed by altruistic contribution ($\beta = 0.17$, $\Delta R^2 = 0.04$), and meaning and value ($\beta = 0.14$, $\Delta R^2 = 0.01$).

Table 8. Regression Analysis of Carrer Calling Predicting Learning Engagement

Model	Outcome	Predictor	R^2	ΔR^2	F	ΔF	B	β	t
1	AE	PC Total	0.26	0.26	671.04^{***}	671.04^{***}	0.71	0.51	25.91^{***}
2	AE	Orientation	0.21	0.21	520.15^{***}	520.15^{***}	0.30	0.27	10.02^{***}
		Altruistic Contribution	0.25	0.04	323.60^{***}	100.16^{***}	0.22	0.17	5.48^{***}
		Meaning & Value	0.26	0.01	224.50^{***}	19.93^{***}	0.18	0.14	4.46^{***}

Note: AE = Learning Engagement; PC = Carrer Calling.

Table 9 presents the stepwise regression results for each dimension of carrer calling predicting each dimension of learning engagement. For motivation, altruistic contribution entered the equation first ($\beta = 0.21$, $\Delta R^2 = .22$, $p < 0.001$), followed by orientation ($\beta = 0.18$, $\Delta R^2 = 0.03$) and meaning and value ($\beta = 0.19$, $\Delta R^2 = 0.01$); the final model explained 26% of variance. For concentration, orientation entered first ($\beta = 0.26$, $\Delta R^2 = 0.18$), followed by altruistic contribution ($\beta = 0.14$, $\Delta R^2 = 0.03$) and meaning and value ($\beta = 0.12$, $\Delta R^2 = 0.01$); 21% explained. For energy, orientation again entered first ($\beta = 0.32$, $\Delta R^2 = 0.21$), followed by altruistic contribution ($\beta = 0.13$, $\Delta R^2 = 0.02$) and meaning and value ($\beta = 0.09$, $\Delta R^2 = 0.01$); 24% explained.

Table 9. Stepwise Regression of Carrer Calling Dimensions Predicting Learning Engagement Dimensions

Outcome	Predictor	R^2	ΔR^2	F	ΔF	B	β	t
Motivation	Altruistic Contribution	0.22	0.22	526.11^{***}	526.11^{***}	0.28	0.21	6.77^{***}
	Orientation	0.25	0.03	314.44^{***}	80.88^{***}	0.20	0.18	6.72^{***}
	Meaning & Value	0.26	0.01	225.26^{***}	35.58^{***}	0.25	0.19	5.97^{***}

Concentration	Orientation	0.18	0.18	419.54***	419.54***	0.31	0.26	9.44***
	Altruistic Contribution	0.21	0.03	250.22***	66.57***	0.20	0.14	4.41***
	Meaning & Value	0.21	0.01	172.50***	13.74***	0.16	0.12	3.71***
Energy	Orientation	0.21	0.21	518.27***	518.27***	0.39	0.32	11.81***
	Altruistic Contribution	0.23	0.02	293.42***	54.21***	0.19	0.13	4.21***
	Meaning & Value	0.24	0.01	199.27***	8.64**	0.13	0.09	2.94**

4. Discussion

4.1 Current Status of Medical Students' Carrer Calling and Learning Engagement

The results indicated that medical students scored above the theoretical midpoints on both carrer calling and learning engagement, reflecting an overall moderately high level on both constructs. Among the calling dimensions, meaning and value scored highest, followed by altruistic contribution, with orientation scoring lowest. This suggests that while medical students strongly identify with the meaning and altruistic value of the medical profession, there remains room for improvement in translating calling into clear vocational direction and action. Among engagement dimensions, motivation scored highest, followed by concentration, with energy lowest — indicating strong learning drive but notable depletion in sustained physical and psychological effort, consistent with the heavy demands of medical training.

4.2 Group Differences in Carrer Calling and Learning Engagement

4.2.1 Gender

Gender was not a significant factor for either carrer calling or learning engagement, consistent with prior research. The core of carrer calling — subjective perception of vocational meaning and value — is driven more by professional identity, socialization, and personal values than by biological sex (Dik & Duffy, 2009). Thus, it is theoretically expected that male and female medical students show similar calling development when exposed to the same educational context (Lam et al., 2023).

4.2.2 Hometown Background

A significant hometown difference emerged only in the altruistic contribution dimension of carrer calling, with urban students scoring higher than rural students. This is likely attributable to differences in socialization background and early educational exposure. Urban students have more opportunities from childhood to encounter healthcare settings and receive formal and informal socialization about the altruistic values of medicine, enabling them to develop a more mature altruistic identity prior to entering medical school (Dik & Duffy, 2009).

4.2.3 Student Cadre Experience

Students with student cadre experience scored significantly higher on both carrer calling and learning engagement across all dimensions. Student cadre roles are fundamentally service-oriented leadership practices; through organizational responsibilities, students are frequently exposed to contexts of serving

others, taking responsibility, and pursuing collective goals — experiences that align closely with the altruistic contribution and meaning perception dimensions of carrer calling. This finding is consistent with Astin's (1993) Input-Environment-Output model, which emphasizes that student leadership roles and prosocial practice experiences significantly promote character development. Further, the engagement advantage among student cadres is likely mediated through enhanced self-efficacy and resilience, which are key internal mechanisms driving learning engagement (Bandura, 1997).

4.2.4 Grade

Significant grade differences were found for both carrer calling and learning engagement, with Year 2 students consistently scoring lowest — consistent with the internationally documented 'sophomore slump.' Year 2 represents a critical vulnerable period as students transition from basic science courses to more demanding professional content, face heightened academic pressure, and have not yet encountered clinical practice. Accumulated stress during this phase undermines vocational mission identification and depletes learning energy, with the energy dimension scoring closest to the theoretical midpoint. In contrast, Year 4+ students demonstrated the highest scores on engagement total, motivation, and concentration dimensions, likely due to clinical exposure, clearer professional identity, and graduation-driven motivation (Schaufeli & Bakker, 2003).

4.3 The Relationship Between Carrer Calling and Learning Engagement

4.3.1 Predictive Effect of Carrer Calling on Learning Engagement

Carrer calling significantly and positively predicted learning engagement, accounting for 26% of its variance. This is consistent with prior literature demonstrating that calling, as an intrinsically driven transcendent construct, fundamentally activates the inner motivation for sustained learning (Dik & Duffy, 2009). Per Self-Determination Theory, satisfaction of the needs for autonomy, competence, and relatedness generates stronger intrinsic motivation, which significantly enhances learning engagement (Ryan & Deci, 2017). Carrer calling serves as a robust fulfillment mechanism for these needs (Elangovan et al., 2010).

4.3.2 Prediction by Calling Dimensions

Orientation emerged as the strongest predictor of overall learning engagement ($\Delta R^2 = .21$), reflecting the theoretical alignment between a clear sense of vocational direction and the action-oriented, goal-directed core of engagement. Students with clear action orientation more effectively manage their time and mobilize intrinsic motivation, achieving higher engagement levels (Peker, 2024). Altruistic contribution was the second-strongest predictor, confirming that prosocial motivation is an important source of engagement drive in a medical education context. Meaning and value showed relatively limited incremental explanatory power, possibly because this dimension's effect operates more indirectly through mediating variables such as self-efficacy and vocational identity rather than directly driving engagement behavior (Hirschi & Herrmann, 2012).

4.3.3 Dimensional Predictions of Engagement Sub-Dimensions

Across all three engagement sub-dimensions, the three calling dimensions entered each regression equation but differed in entry order and explanatory power. Altruistic contribution led in predicting motivation, consistent with SDT evidence that prosocial values activate relational needs and calling, thereby enhancing intrinsic learning motivation. Orientation led in predicting both concentration and energy — students with clearer vocational goals are better able to sustain focused attention and physical/psychological effort even under the demanding conditions of medical training (Bandura, 1997).

4.4 Practical Implications

4.4.1 Integrate Calling Cultivation into Core Curriculum Design

Given that orientation was the strongest predictor of learning engagement, cultivating a clear sense of vocational direction should be a core educational goal. Medical education should go beyond knowledge transmission to actively embed vocational meaning, the physician's mission, and value-related themes into teaching contexts through early clinical exposure, narrative medicine pedagogy, and career values workshops (Dik & Duffy, 2009).

4.4.2 Prioritize Year 2 Students and Establish Early Warning Systems

Year 2 consistently emerged as a dual low point for both carrer calling and learning engagement. Medical schools should treat Year 2 as a priority intervention window, encouraging students to actively explore learning meaning and career values, strengthening regular interaction with academic mentors, and establishing systematic early warning mechanisms to provide timely counseling and remedial support.

4.4.3 Implement Dimension-Specific Targeted Interventions

Given that altruistic contribution most strongly predicts motivation while orientation most strongly predicts concentration and energy, interventions should be differentiated: for students with low learning motivation, prioritize cultivating prosocial values and professional responsibility; for students with deficits in concentration and energy, focus on clarifying vocational goals. School-level interventions should also address proximal factors such as teaching quality, learning atmosphere, and assessment design in coordination with calling-based education.

References

1. Astin, A. W. (1993). What matters in college? Four critical years revisited. Jossey-Bass/Wiley.
2. Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.
3. Boone, A., Braeckman, L., Michels, N., Van den Broeck, K., Kindermans, H., Roex, A., Lambrechts, M. C., Vandenbroeck, S., Bijnens, A., Van den Acker, S., Boghe, S., Vanneck, C., Devroey, D., & Godderis, L. (2025). Burnout in medical education: interventions from a co-creation process. *BMC medical education*, *25*(1), 230.
4. Dik, B. J., & Duffy, R. D. (2009). Calling and vocation at work. *The Counseling Psychologist, 37*(3), 424–450.
5. Dik, B. J., & Duffy, R. D. (2009). Calling and vocation at work: Definitions and prospects for research and practice. *The Counseling Psychologist, 37*(3), 424–450.
6. Duffy, R. D., & Dik, B. J. (2013). Research on calling: What have we learned and where are we going? *Journal of Vocational Behavior, 83*(3), 428–436.
7. Duffy, R. D., & Sedlacek, W. E. (2007). The presence of and search for a calling: Connections to career development. *Journal of Vocational Behavior, 70*(3), 590–601.
8. Elangovan, A. R., Pinder, C. C., & McLean, M. (2010). Callings and organizational behavior. *Journal of Vocational Behavior, 76*(3), 428–440.
9. Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School Engagement: Potential of the Concept, State of the Evidence. *Review of Educational Research, 74*(1), 59–109.
10. Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*(4), 331–362.
11. Hirschi, A., & Herrmann, A. (2012). Vocational identity achievement as a mediator of presence of calling and life satisfaction. *Journal of Career Assessment, 20*(3), 309–321.

12. Lam, S. F., Jimerson, S., Kikas, E., Cefai, C., Veiga, F. H., Nelson, B., Hatzichristou, C., Polychroni, F., Basnett, J., Duck, R., Farrell, P., Liu, Y., Negovan, V., Shin, H., Stanculescu, E., Wong, B. P., Yang, H., & Zollneritsch, J. (2012). Do girls and boys perceive themselves as equally engaged in school? The results of an international study from 12 countries. *Journal of school psychology*, *50*(1), 77–94.
13. Li, X., & Huang, R. (2010). Revision of the Utrecht Work Engagement Scale–Student (UWES-S) for Chinese college students. *Psychological Research*, 3(1), 84–88.
14. Peker, M. (2024). Willing, able, and engaged: Roles of action-state orientation, intrinsic academic motivation, and time management on learning engagement. *Current Psychology*, 43, 18444–18454.
15. Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness.* The Guilford Press
16. Schaufeli, W. B., & Bakker, A. B. (2003). *Utrecht work engagement scale: Preliminary manual.* Utrecht University.
17. Schaufeli, W. B., Martínez, I. M., Marques Pinto, A., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students: A cross-national study. *Journal of Cross-Cultural Psychology, 33*(5), 464–481.
18. Sun, H., & Liu, X. (2018). Meta-analysis of factors affecting Chinese university students' learning burnout. *Journal of Beijing University of Aeronautics and Astronautics (Social Sciences Edition)*, 31(3), 109–114.
19. Taber, B. J., & Blankemeyer, M. (2015). Future work self and career adaptability in the prediction of proactive career behaviors. *Journal of Vocational Behavior, 86,* 20–27.
20. Zhang, C. (2015). *Career calling: Structure, measurement, and its relationship with well-being* (Doctoral dissertation, Southwest University).

Funding

This article is a phased achievement of the 2025 Guangxi University of Chinese Medicine Education Teaching Reform and Research Project "From Fluctuation to Certainty: The Development Law of Medical Students' Career calling and the Construction of a Step-by-step Psychological Education Support System" (Project Number: 2025B009).