

Teachers' Caring Behaviors and Students' Learning Outcomes: The Mediating Role of Self-Efficacy in Chinese College Students

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ABSTRACT

Teachers' caring behaviors have been identified as a key factor in fostering positive student learning outcomes, yet the underlying mechanisms of this relationship remain insufficiently explored. Drawing upon social cognitive theory, this study investigates the mediating role of self-efficacy in the link between teachers' caring behaviors and students' learning outcomes among college students enrolled in physical education courses in China. This study collected 384 valid responses from students across eight universities in Guangxi Province, including both public and private undergraduate institutions. All sampled universities offered physical education courses. Standardized instruments were used to measure teachers' caring behaviors, self-efficacy, and student learning outcomes. SPSS 29.0 and PROCESS Macro (Model 4) were employed to assess the hypothesized mediation model using 5,000 bootstrap samples. The findings indicated that teachers' caring behaviors significantly predicted students' self-efficacy ($\beta = 0.327, p < .001$), which in turn positively predicted their learning outcomes ($\beta = 0.289, p < .001$). The indirect effect of teachers' caring on learning outcomes through self-efficacy was significant ($\beta = 0.095$), with a 95% bias-corrected confidence interval [0.058, 0.144] not including zero, confirming the mediating role. The total effect ($\beta = 0.271$) remained significant, while the direct effect ($\beta = 0.176$) was reduced but still statistically meaningful. Self-efficacy partially mediates the relationship between teachers' caring behaviors and students' learning outcomes. These findings highlight the importance of fostering student self-efficacy in educational contexts to enhance learning outcomes, particularly in physical education settings.

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Contribution/Originality: This study contributes to the existing literature by empirically examining teachers' caring behaviors and learning outcomes among Chinese college students. This study is one of very few studies which have investigated learning self-efficacy as a mediating mechanism, documenting that teachers' care enhances academic outcomes through strengthened student self-efficacy.

1. Introduction

The impact of teachers' caring behaviors on students' academic performance has received extensive scholarly attention. Zhang and Zou (2024) emphasized that teacher support, encouragement, and concern can significantly enhance students' learning motivation and academic achievement. Particularly within the context of Chinese higher education, teachers' caring behaviors play a crucial role in improving students' learning outcomes. Emotional care from teachers can strengthen students' engagement in learning and provide psychological support when they face academic challenges, thereby helping them maintain a positive learning state and improve their academic achievement. Peng and Li (2025) further emphasized that teacher emotional support exerts a profound influence on students' academic growth and learning experience. Such a caring environment fosters a positive classroom climate and contributes to students' holistic development.

Although previous studies generally acknowledge the positive relationship between teachers' caring behaviors and students' learning outcomes, and self-efficacy has been identified as a key psychological mechanism influencing academic performance (Affuso et al., 2023; Liu et al., 2023), the interaction mechanism among teacher care, self-efficacy, and learning outcomes remains insufficiently explored in the context of Chinese university students. Zeng et al. (2024) found that both variables independently affect learning outcomes but did not clarify their internal linkage. Chou et al. (2024) argued that teacher support promotes learning outcomes through enhanced student engagement, yet the mediating role of self-efficacy in this process has not received sufficient empirical attention. Therefore, this study aims to investigate how learning self-efficacy mediates the relationship between teachers' caring behaviors and students' learning outcomes, with a specific focus on Chinese university students. The findings are expected to offer new insights and theoretical contributions to the field of teaching and learning practices.

1.1. Research Objectives

The primary objective of this study is to explore the psychological mechanisms through which teacher caring behaviors influence students' learning outcomes among Chinese college students, with a particular focus on the mediating role of self-efficacy. Specifically, this research aims to:

- i. Investigate the direct relationship between teachers' caring behaviors and students' learning outcomes, particularly academic performance.
- ii. Assess the extent to which students' self-efficacy mediates the relationship between teachers' caring behaviors and their learning outcomes.
- iii. Examine self-efficacy in shaping the impact of teachers' caring behaviors on students' motivation, engagement, and academic achievements.

By addressing these objectives, this study aims to provide empirical evidence on the critical role of self-efficacy in the educational outcomes of Chinese college students, and inform potential strategies to enhance student learning outcomes through teacher support and self-efficacy development.

2. Literature Review

Teachers' caring behaviors play a crucial role in students' learning outcomes. According to the study by [Ilhavenil and Aravindan \(2023\)](#), teachers' caring behaviors, through emotional support, motivation, and guidance, enhance students' learning motivation and engagement, thereby improving academic performance. This viewpoint aligns with the findings of [Kahveci \(2023\)](#), who further indicates that teachers' positive attitudes and behaviors not only influence students' learning progress but also indirectly foster academic success by boosting students' learning confidence. However, [Zhang \(2024\)](#) expands on this perspective by emphasizing that teachers' caring behaviors, by shaping students' learning attitudes and behaviors, can effectively improve their learning experiences and promote better learning outcomes. In contrast, while [Martinez and Wighting \(2023\)](#) also highlight the role of teacher support, they regard it as a key predictor of academic performance, underscoring the universal applicability of teachers' caring behaviors. [Tran et al. \(2025\)](#), however, argue that the specific forms and effects of teachers' caring behaviors may vary across different educational settings, particularly in balancing emotional support and academic guidance, which may influence students' learning outcomes. Therefore, there is a close relationship between teachers' caring behaviors and students' learning outcomes.

Self-efficacy, as an important factor influencing learning outcomes, has been shown to mediate the relationship between teachers' caring behaviors and students' learning outcomes. [Affuso et al. \(2023\)](#) argue that self-efficacy helps students better cope with academic challenges, enhancing their learning motivation and engagement. This view is consistent with the findings of [Derakhshan and Fathi \(2024\)](#), who emphasize that self-efficacy helps students maintain a positive attitude in the face of difficulties, thus improving learning outcomes. However, [Hejazi and Sadoughi \(2023\)](#) point out that teachers' support enhances students' self-efficacy, which in turn indirectly promotes their academic participation and learning outcomes. Their research underscores the role of teacher support in enhancing self-efficacy, suggesting that teachers' behaviors not only directly impact students' emotions and behaviors but also indirectly affect learning outcomes through self-efficacy. In contrast, [Jeilani and Abubakar \(2025\)](#) further explore the role of technological self-efficacy in the learning environment, suggesting that improvements in self-efficacy when students engage with technology-driven learning platforms can significantly influence learning outcomes. Therefore, self-efficacy plays a vital role in the mechanism linking teachers' caring behaviors and learning outcomes.

Students' self-efficacy is also influenced by the learning environment and teaching models. [Alemayehu and Chen \(2023\)](#) found that in online learning environments, self-efficacy significantly impacts students' learning engagement, and this influence is enhanced through self-monitoring and motivation. This aligns with the findings of [Wang et al. \(2023a\)](#), who also emphasize that self-efficacy helps students cope with stress and anxiety, thereby improving their academic performance in competitive and exam-oriented learning environments. However, [Chiu et al. \(2024\)](#) highlight the combination of teacher support and self-efficacy, indicating that teachers can effectively stimulate students' learning motivation and improve their academic performance. These studies

consistently recognize the importance of self-efficacy in the learning environment, but their focuses differ: [Alemayehu and Chen \(2023\)](#) focus on self-monitoring in online learning environments, while [Wang et al. \(2023a\)](#) emphasize stress management in traditional educational settings. Furthermore, [Jintalan \(2025\)](#), in his study of teaching models, suggests that in outcomes-based teaching models, self-efficacy not only affects students' academic engagement but also influences their overall attitude toward learning and learning outcomes. [Jintalan's \(2025\)](#) research differs from that of [Alemayehu and Chen \(2023\)](#) as it explores the relationship between outcome-based learning assessments and self-efficacy, whereas the latter primarily focuses on motivation and self-monitoring.

In the context of Chinese higher education, the relationship between teachers' caring behaviors, self-efficacy, and students' learning outcomes is especially important. [Li et al. \(2024\)](#) found that Chinese college students often face significant external pressure in academic performance, and teachers' caring behaviors provide the necessary support in such situations, enhancing students' self-efficacy and ultimately improving their academic achievements. This finding aligns with [Zhang and Xu \(2023\)](#), who also identify the unique role of teachers' caring behaviors in the Chinese academic context, emphasizing that improving students' learning adaptability and self-efficacy can significantly promote learning outcomes. Both studies emphasize the critical role of teachers' caring behaviors in alleviating academic pressure and helping students cope with academic challenges. However, [Wang et al. \(2023b\)](#) differ in some respects, further highlighting the significant relationship between teacher support and students' self-efficacy in the Chinese educational environment, suggesting that this relationship effectively enhances academic performance. Their study focuses on the direct impact of the combination of teacher support and self-efficacy on academic performance, offering stronger practical implications. In contrast, [Peng and Li \(2025\)](#) further explore the influence of the kindergarten organizational climate on teachers' caring behaviors and find that teachers' self-efficacy plays a key role in this process. Therefore, this study explores the interrelationship between teachers' caring behaviors, self-efficacy, and learning outcomes, which not only holds theoretical significance but also provides practical guidance for educators.

Although existing studies have identified individual effects of caring behaviors or self-efficacy on academic performance, fewer have examined the complex relationship among teachers' caring behaviors, students' self-efficacy, and learning outcomes. Particularly in the Chinese educational context, where students face considerable academic stress, the interplay between these factors remains underexplored. By analyzing the mediating role of self-efficacy in the relationship between teachers' caring behaviors and students' learning outcomes, this study aims to fill this research gap and provide a theoretical foundation for educational practices. The findings are expected to offer practical insights into how educators can foster self-efficacy and adopt caring behaviors to enhance students' academic success.

3. Method

This study was conducted in Guangxi, a southwestern province in China, with data collected from eight undergraduate universities, including both public and private institutions. Guangxi represents a region characterized by its ethnic diversity, urban-rural educational disparities, and complex cultural dynamics, offering a rich contextual background for investigating the interplay between teachers' caring behaviors, learning

self-efficacy, and students' learning outcomes. In Guangxi's universities, academic performance is highly emphasized, and teachers' emotional engagement and instructional attitudes—particularly in physical education courses—are often perceived as exerting a strong individual influence on students. The cultural and institutional diversity across these universities, combined with students' varying academic pressures, creates an environment conducive to exploring how teachers' caring behaviors shape learning self-efficacy and learning outcomes across different types of institutions and cultural settings. Additionally, the uneven distribution of teaching resources and diverse academic expectations within Guangxi's higher education landscape mean that university students often face considerable academic challenges and psychological stress, even while receiving teacher support. These conditions enhance the theoretical and practical value of examining the mechanisms through which self-efficacy develops and influences academic performance. Therefore, selecting Guangxi as the study site is not only theoretically appropriate but also holds practical implications for advancing empirical research on the relationship between teachers' caring behaviors, self-efficacy, and student development in the Chinese educational context.

This study employed a quantitative cross-sectional survey design grounded in social cognitive theory to examine the relationships among teachers' caring behaviors, learning self-efficacy, and learning outcomes, with a particular focus on the mediating role of learning self-efficacy. The research was conducted in eight universities located in Guangxi, a province in southwest China, including both public and private institutions. The study population was clearly defined as undergraduate students who were enrolled in physical education courses at these universities; the research exclusively targeted student participants rather than teachers or other educational stakeholders. In designing the study, reference was made to [Cohen's \(1988\)](#) recommendation regarding a medium effect size, together with prior literature on sample size requirements for regression-based mediation analysis, which generally suggests that a sample of more than 300 participants is sufficient to achieve adequate statistical power for path analysis and mediation testing. A stratified cluster sampling method was applied, stratifying by university type and using class groups as sampling units, resulting in 384 valid responses. To ensure measurement reliability and validity, three validated instruments were employed. Teachers' caring behaviors were assessed using [Lei's \(2014\)](#) revised Teachers' Caring Behaviors Scale, which was contextualized for physical education courses. The scale included 18 items across three dimensions—conscientiousness, supportiveness, and inclusiveness—rated on a five-point Likert scale. Learning self-efficacy was measured using [Li's \(2014\)](#) scale comprising 22 items across two dimensions: learning ability self-efficacy and learning behavior self-efficacy, also rated on a five-point scale. Learning outcomes were measured based on [Zhang's \(2024\)](#) framework, which consisted of 11 items divided into two dimensions: teaching satisfaction and self-evaluation satisfaction, rated on the same five-point scale. Higher scores on each instrument indicated higher levels of perceived teacher care, learning self-efficacy, and learning outcomes, respectively.

Data collection was conducted during regular class sessions. Participants received an information sheet detailing the study's purpose and confidentiality assurances and provided written informed consent prior to participation. All responses were anonymous. Ethical approval was obtained from the Research Ethics Committee of Kuala Lumpur University of Science & Technology (KLUST). Data were analyzed using SPSS 29.0 and the PROCESS Macro (Model 4) developed by [Hayes \(2013\)](#). Descriptive statistics and Pearson correlation analyses were first performed, followed by

regression-based mediation analysis. The bootstrap method with 5,000 resamples was applied to estimate bias-corrected 95% confidence intervals, with mediation considered significant when the confidence interval excluded zero. This methodological design, encompassing research approach, sampling, measurement instruments, procedures, and data analysis, aligns with the theoretical framework and ensures the robustness and validity of the findings.

4. Findings

4.1. Demography

This study involved a total of 384 undergraduate students enrolled in physical education courses across eight universities in Guangxi Province, China, including both public and private institutions. Data collection was facilitated by physical education instructors during scheduled class sessions, with the support of trained research assistants and institutional staff. Among the participants, 52.3% were male and 47.7% were female, reflecting a relatively balanced gender distribution within the sports education context. In terms of academic year, 21.2% were freshmen, 27.3% were sophomores, 30.7% were juniors, and 20.8% were seniors, indicating a diverse representation across year levels. Regarding institutional type, 61.2% of the students came from public universities, while 38.8% were from private universities. As for students' primary motivation for taking physical education courses, 36.4% reported health and fitness, 33.9% cited credit requirements, 25.0% indicated a strong interest in sports, and 4.7% selected other reasons, such as peer influence or teacher encouragement. This distribution suggests that while external academic requirements play a significant role, a considerable portion of students are intrinsically motivated or value physical well-being through active participation. The demographic diversity and course-specific context of the sample enhance the generalizability of the findings within the scope of Chinese university physical education, particularly for exploring the relationships among teachers' caring behaviors, self-efficacy, and learning outcomes. [Table 1](#) shows the background information of the respondents.

Table 1: Demographics Profile of the Respondents (n = 384)

Profile	Description	Frequency	Percentage
Gender	Male	201	52.3%
	Female	183	47.7%
Age	Freshmen	81	21.2%
	Sophomores	105	27.3%
	Juniors	118	30.7%
	Seniors	80	20.8%
School Type	Public Universities	235	61.2%
	Private Universities	149	38.8%
Physical Education Motivation	Credit Requirements	130	33.9%
	Health and Fitness	140	36.4%
	Strong Interest in Sports	96	25.0%
	Other	18	4.7%

4.2. Direct relationship between teachers' caring behaviors and students' learning outcomes, particularly academic performance

The present study employed Pearson correlation analysis to examine the association between teachers' caring behaviors and students' learning outcomes. The Pearson correlation coefficient ranges from -1 to $+1$, where $+1$ indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 represents no linear relationship. The results of the correlation analysis are presented in Table 2.

Table 2: Correlation Analysis Between Teachers' Caring Behaviors and Students' Learning Outcomes

	Teachers' Caring Behaviors	Students' Learning Outcomes
Teachers' Caring Behaviors	1	
Students' Learning Outcomes	.373**	1

As shown in Table 2, teachers' caring behaviors are significantly and positively correlated with students' learning outcomes ($r = .373$, $p < .01$). This indicates that when university students perceive higher levels of teachers' caring behaviors, their learning outcomes—such as academic performance and learning attitudes—tend to improve correspondingly. In other words, teachers' caring behaviors play a meaningful role in enhancing students' learning outcomes. Furthermore, the correlation coefficient reflects a moderate-strength association, suggesting that the effect of teachers' caring behaviors on students' learning outcomes is stable and statistically significant. These findings provide an empirical foundation for further examining the underlying mechanisms, such as the potential mediating role of learning self-efficacy.

4.3. Students' self-efficacy mediates the relationship between teachers' caring behaviors and their learning outcomes

This study employed Model 4 of the PROCESS macro proposed by Hayes (2013) within SPSS 29.0 to examine the mediating effect of students' learning self-efficacy on the relationship between teachers' caring behaviors (independent variable) and learning outcomes (dependent variable). The analysis revealed that teachers' caring behaviors significantly and positively predicted students' learning self-efficacy (path $a = 0.327$, $p < .001$), indicating that higher levels of caring behaviors exhibited by teachers were associated with enhanced self-efficacy among students. Further, learning self-efficacy was found to significantly and positively predict students' learning outcomes (path $b = 0.289$, $p < .001$), suggesting that students with greater self-efficacy tended to achieve better academic performance. To verify the significance of the mediating effect, a bootstrap test with 5,000 resamples was conducted. The results showed that the indirect effect of teachers' caring behaviors on learning outcomes via learning self-efficacy was significant (indirect effect $ab = 0.095$, 95% bias-corrected confidence interval $[0.058, 0.144]$, which did not include zero), indicating the presence of a statistically significant mediating effect. Additionally, the direct effect remained significant (path $c' = 0.176$, $p < .01$), confirming that learning self-efficacy partially mediated the relationship between teachers' caring behaviors and learning outcomes. The overall model demonstrated a good level of explanatory power. Specifically, the regression model of teachers' caring behaviors on learning self-efficacy accounted for 30.3% of the variance ($R^2 = 0.303$), while the combined model including both teachers' caring behaviors and learning self-efficacy explained 27.4% of the variance in learning

outcomes ($R^2 = 0.274$). All path coefficients were statistically significant. These findings suggest that teachers' caring behaviors not only have a direct positive impact on students' learning outcomes but also exert a substantial indirect influence through the enhancement of students' learning self-efficacy. In particular, behaviors such as understanding, respect, and emotional support demonstrated by teachers effectively boost students' self-efficacy, which in turn increases their engagement and performance in physical education learning. The significance of this mediating mechanism underscores the synergistic role of emotional support and psychological empowerment in university-level physical education contexts. Figure 1 illustrates the hypothesized mediation model developed in this study, clearly indicating the pathway through which teachers' caring behaviors influence learning outcomes via learning self-efficacy. Table 2 presents the structural path coefficients among teachers' caring behaviors, learning self-efficacy, and learning outcomes, including the statistical values and significance levels of both direct and indirect effects. According to Table 2, all path coefficients were statistically significant ($p < .001$).

Figure 1: A Simple Mediation Model for Teachers' Caring Behaviors and Students' Learning Outcomes with Self-Efficacy as Mediator

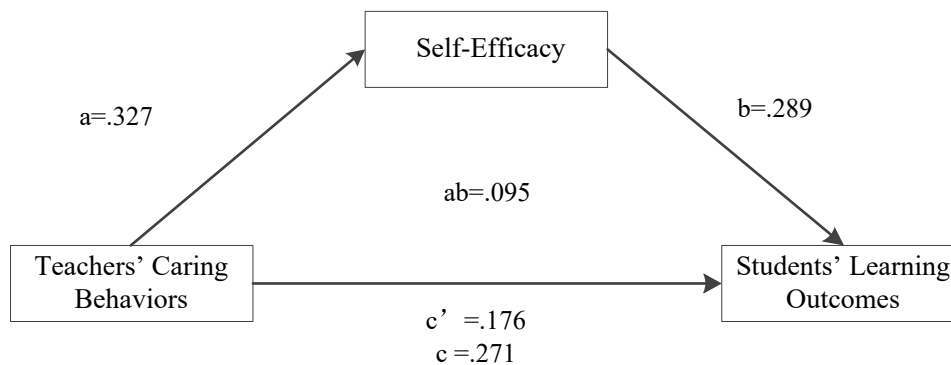


Figure 1 illustrates the hypothesized mediation model, where path a represents the direct effect of the independent variable, teachers' caring behaviors, on the mediating variable, students' learning self-efficacy. The results indicate that the path coefficient is 0.327 and reaches a statistically significant level ($p < .001$), suggesting that when teachers demonstrate behaviors characterized by care, support, respect, and encouragement, students' perceived self-efficacy is significantly enhanced. Path b reflects the predictive effect of the mediating variable, learning self-efficacy, on the dependent variable, learning outcomes. The path coefficient is 0.289 ($p < .001$), indicating that students who hold more positive beliefs about their physical education learning capabilities are more likely to achieve better learning outcomes. Path c denotes the total effect of teachers' caring behaviors on learning outcomes without controlling for the mediating variable. The coefficient of 0.271 ($p < .001$) reveals that, overall, teachers' caring behaviors exert a significant positive influence on students' learning outcomes. Path c' represents the direct effect of teachers' caring behaviors on learning outcomes after accounting for the mediating effect of learning self-efficacy. The direct effect remains significant with a coefficient of 0.176 ($p < .01$), supporting the presence of a partial mediation. This implies that learning self-efficacy partially mediates the relationship between teachers' caring behaviors and students' learning outcomes. In other words, beyond the indirect effect mediated through students' enhanced self-efficacy, teachers' caring behaviors also exert a direct and independent effect on learning effectiveness. These findings collectively underscore the dual mechanism

through which emotional support from teachers in physical education settings contributes to students' academic success: both by empowering students psychologically (i.e., strengthening their learning self-efficacy) and by providing direct instructional and emotional benefits.

4.4. Self-efficacy shapes the impact of teachers' caring behaviors on students' motivation, engagement, and academic achievements

As shown in Table 3, teachers' caring behaviors had a significant positive predictive effect on university students' learning self-efficacy ($\beta = 0.327$, $p < .001$). This finding indicates that when students perceive higher levels of teacher support, encouragement, and attention, they are more likely to develop stronger confidence in their learning capabilities. The standard error (SE = 0.045) and t-value ($t = 7.27$) demonstrate the statistical stability of this effect. The 95% confidence interval [0.238, 0.416] further confirms that this relationship is both significant and positive. Consistent with social cognitive theory, this result suggests that a supportive social environment reinforces individuals' self-beliefs. In educational contexts, teachers' caring behaviors-embodiment conscientiousness, supportiveness, and inclusiveness-provide students with learning support, ability support, and emotional support. Such behaviors not only fulfill students' emotional needs but also strengthen their sense of control and learning self-efficacy. Within this caring atmosphere, students tend to sustain higher levels of motivation and persistence. Continuous understanding and commitment from teachers help students form positive self-perceptions and learning attitudes, thereby laying the foundation for improved learning self-efficacy.

Table 3: Model Coefficients for the Simple Mediation Model

Path	Coefficient (β)	SE	t / Z	95% CI	p
a: Teachers' Caring $\rightarrow$ Self-Efficacy	0.327	0.045	7.27	[0.238, 0.416]	<.001
b: Self-Efficacy $\rightarrow$ Learning Outcomes	0.289	0.041	7.05	[0.208, 0.370]	<.001
c: Total Effect (direct + indirect)	0.271	0.052	5.21	[0.169, 0.373]	<.001
c': Direct Effect (controlling for M)	0.176	0.048	3.67	[0.081, 0.271]	<.01
ab: Indirect Effect ($a \times b$)	0.095	—	—	[0.058, 0.144]	—
Sobel Test (Z)	—	—	4.87	—	<.001

The analysis also revealed that learning self-efficacy had a significant positive impact on learning outcomes ($\beta = 0.289$, $p < .001$). This means that students with stronger self-efficacy beliefs generally achieve better academic performance and experience higher levels of learning satisfaction. The standard error (SE = 0.041) and t-value ($t = 7.05$) confirm the robustness of this finding, and the 95% confidence interval [0.208, 0.370] supports its statistical reliability. Theoretically, students with high levels of learning self-efficacy are more likely to adopt effective learning strategies and maintain motivation and confidence when encountering academic challenges. In practice, they are better at setting goals, managing time, and persisting in the face of difficulties. This result aligns with Bandura's self-efficacy theory, which posits that self-beliefs directly influence cognitive engagement and learning behavior. Therefore, enhancing students' learning

ability self-efficacy and learning behavior self-efficacy can lead to improved academic outcomes. When teachers strengthen students' confidence, autonomy, and resilience through effective pedagogical support, they indirectly facilitate higher academic achievement.

Furthermore, the study found that the total effect of teachers' caring behaviors on learning outcomes was significant ($\beta = 0.271$, $p < .001$), while the direct effect—after controlling for learning self-efficacy—remained significant but decreased ($\beta = 0.176$, $p < .01$), indicating a partial mediating effect. The indirect effect ($ab = 0.095$) was also significant, with a Sobel test result of $Z = 4.87$, $p < .001$, and a 95% confidence interval $[0.058, 0.144]$ excluding zero, confirming the mediation's validity. These findings demonstrate that teachers' caring behaviors influence students' learning outcomes both directly and indirectly through the enhancement of learning self-efficacy. Specifically, when students perceive emotional support and learning care from their teachers, they develop greater confidence and a stronger sense of control over academic tasks, which in turn improves their learning performance. Within the context of Chinese universities, this finding highlights the cultural importance of teacher–student relationships and the psychological mechanisms underlying teaching effectiveness. Teachers who provide consistent emotional, learning, and ability support can more effectively promote students' academic growth. Therefore, the partial mediation model in this study illustrates that teachers' caring behaviors not only directly improve learning outcomes but also exert indirect positive effects by enhancing students' learning self-efficacy.

As shown in [Table 4](#), the total effect was 0.271, indicating that teachers' caring behaviors exerted a generally positive impact on students' learning outcomes. The direct effect was 0.176 and the indirect effect was 0.095. Both were statistically significant within the 95% confidence interval (excluding zero), demonstrating that learning self-efficacy played a partial mediating role in the relationship between teachers' caring behaviors and students' learning outcomes. These findings further support the theoretical proposition that learning self-efficacy serves as a key psychological mechanism linking teacher behavior to student performance, highlighting the importance of enhancing students' beliefs through pedagogical care and emotional support.

Table 4: Indirect Effect of Self-Efficacy on the Relationship Between Teachers' Caring Behaviors and Students' Learning Outcomes

Effect Type	Effect Size (β)	SE	95% CI (Bias-Corrected)
Total Effect (c)	0.271	0.052	[0.169, 0.373]
Direct Effect (c')	0.176	0.048	[0.081, 0.271]
Indirect Effect (ab)	0.095	—	[0.058, 0.144]

5. Discussion

The findings of this study indicate that teachers' caring behaviors have a significant positive impact on students' learning outcomes. [Kahveci \(2023\)](#) suggests that teachers' positive attitudes and caring behaviors directly influence students' learning progress, particularly resulting in a significant improvement in academic performance. Similarly, [Martinez and Wighting \(2023\)](#) emphasize that supportive teacher behaviors contribute to creating a positive learning environment, which enhances students' academic performance. [Zhang and Xu \(2023\)](#) further discovered that, in the context of Chinese higher education, teachers' caring behaviors significantly improve students' academic performance by influencing their learning attitudes and behaviors. Additionally, [Khanna](#)

et al. (2024) highlight that by establishing positive teacher-student relationships, teachers' caring behaviors can boost students' motivation, thereby enhancing academic performance. This conclusion is also supported by the research of Tran et al. (2025), which indicates that emotional support and academic guidance from teachers are crucial for students' academic achievements, particularly in higher education. In summary, teachers' caring behaviors significantly promote students' learning outcomes, especially in improving academic performance, through direct support and motivational influences.

The results of this study also show that self-efficacy mediates the relationship between teachers' caring behaviors and students' learning outcomes. According to Affuso et al. (2023), teachers' support can enhance students' self-efficacy, which in turn indirectly promotes their academic performance. Liu et al. (2023) also found that self-efficacy is a crucial mediator between teacher support and students' learning engagement, especially in foreign language learning. Furthermore, Derakhshan and Fathi (2024) point out that improvements in students' self-efficacy help them overcome learning challenges, thereby enhancing learning outcomes. Guo et al. (2023) further emphasize that in blended learning environments, teachers' caring behaviors can boost students' self-efficacy, and through this mechanism, improve students' learning outcomes. Zhang and Xu (2023) also found that, in the Chinese educational context, self-efficacy plays a vital mediating role between teachers' caring behaviors and students' learning outcomes, particularly in alleviating student stress and improving academic performance. Therefore, self-efficacy plays a key mediating role between teachers' caring behaviors and academic outcomes, especially in enhancing students' motivation and engagement in the learning process.

The findings of this study indicate that self-efficacy plays a crucial role in the impact of teachers' caring behaviors on students' motivation, engagement, and academic achievements. Alemayehu and Chen (2023) found that students' self-efficacy enhances their learning motivation, which in turn improves their learning engagement and academic performance. Chiu et al. (2024) emphasize that the combination of teacher support and self-efficacy can effectively boost students' learning motivation, particularly when using AI-assisted learning, as it significantly increases students' engagement and learning drive. Moreover, Guo et al. (2023) found that in a blended learning environment, teachers' caring behaviors significantly enhanced students' self-efficacy, which subsequently improved their academic outcomes. This finding aligns with Zhang (2024), who also highlights that teachers' caring behaviors, by enhancing students' self-efficacy, strengthen their learning participation and motivation. Derakhshan and Fathi (2024) further add that, in the context of online learning, improving self-efficacy helps students better cope with learning challenges, enhancing their learning engagement and academic achievement. Overall, teachers' caring behaviors, through enhancing students' self-efficacy, not only strengthen students' learning motivation and engagement but also significantly promote the improvement of academic performance.

6. Conclusion

The results of this study provide empirical evidence for the mechanism by which teachers' caring behaviors influence learning outcomes through students' self-efficacy. In the context of physical education courses, College Students who perceive teachers' care and support are more likely to develop higher levels of learning self-efficacy, which in turn enhances their learning outcomes. This finding indicates that teachers' caring behaviors not only directly affect students' emotional and psychological states but also

indirectly foster academic achievements by boosting self-efficacy. Furthermore, this study expands the understanding of the role of self-efficacy in the field of educational psychology, revealing its crucial role in transforming external social support into internal learning motivation. The research highlights the vital role of teachers' caring behaviors in fostering students' self-efficacy, especially in learning environments that emphasize psychological and emotional support, such as physical education courses, where teachers' support significantly enhances students' learning motivation and academic performance.

These findings offer important insights for educational practice, particularly regarding how teacher support behaviors can promote students' learning confidence and academic success. Teachers should focus on creating a positive learning atmosphere, stimulating students' learning motivation, and enhancing students' self-efficacy through caring behaviors to improve academic performance. Future research could further explore the relationship between teachers' caring behaviors and students' self-efficacy across different disciplinary contexts, as well as how educational interventions can strengthen this relationship. Particularly in online and blended learning environments, the interactive effects of teachers' caring behaviors and self-efficacy merit further investigation.

Ethics Approval and Consent to Participate

Ethical approval for this research was granted by the Research Ethics Committee of Kuala Lumpur University of Science and Technology (KLUST). All procedures involving human participants followed institutional and international ethical standards. Written informed consent was obtained from all participants.

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Conflict of Interest

The author declares there are no conflicts of interest.

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