

Teacher Support and Student Engagement in Physical Education: The Mediating Role of Student Self-Efficacy Among Undergraduates at Jining Normal University

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ABSTRACT:

Amid the national attention on whole-person undergraduate education reform and ongoing concern over low participation in university physical education (PE) in China, this study examines how teacher support predicts student engagement in PE, considering the mediating effect of student self-efficacy among undergraduates in Jining Normal University. A quantitative research design was conducted by using a structured questionnaire, collecting data from 400 undergraduates doing compulsory PE courses. The data were analyzed by using SPSS, confirmatory factor analysis (CFA), structural equation modelling (SEM) and bootstrapping via AMOS 28.0 to examine the direct and indirect effects. Results indicate that teacher support has a positive significant influence on student engagement and student self-efficacy, while student self-efficacy is a significant predictor of student engagement. Furthermore, self-efficacy partially mediates the impact of teacher support on student engagement, which suggests that supportive teaching practices can promote engagement directly and indirectly by increasing student's confidence in their physical competence. This study contributes to the literature by generalizing research on teacher support and student engagement to the context of Chinese university PE, self-efficacy as a key psychology mechanism in explaining the relationship between teacher support and student engagement, and practical implications for PE teachers who desire to increase students' active involvement and meaningful learning through supportive pedagogical approaches.

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1. Introduction

Higher education has been progressively

focusing on the holistic student development including aspects other than academic performance such as physical well-being, mental

health, and students' involvement in learning (Zhang, 2024). Under this more general educational aim, physical education (PE) has also been highlighted as a mandatory and critical part of undergraduate education in China (An et al., 2022). The purposes of university PE courses are to improve students' physical fitness and motor skill as well as to develop positive attitudes for life-long physical activity, self-management, and perseverance (Shi et al., 2024). Still, universities worldwide are still struggling with poor student attendance, low motivation and passive participation in PE class (Simon-Chico et al., 2023); particularly for students who are not majoring in sport. Consequently, investigating the determinants of sustained engagement in university PE contexts has become a priority for research.

Student engagement is considered a complex construct, involving behavioral, emotional and cognitive engagement in learning processes (Wong & Liem, 2022). Engagement in physical education is expressed in students' active participation in class, emotional involvement in learning experiences, and intention to continue participation in the face of physical and/or psychological difficulties (Hastie et al., 2022). Past studies consistently show that greater engagement in PE predicts better skill mastery, a more positive physical self-concept, and healthier behaviour (Hasanov et al., 2021). Therefore, understanding which instructional and psychosocial variables that promote student engagement holds the key to enhancing the effectiveness of tertiary PE programmes.

Of the many contextual factors that influence student engagement, teacher support emerged as a significant factor. Teacher support is a student's feeling of teacher's care, support, instructional help,

and the extent to which students' own learning needs are considered (Shu et al., 2024). In PE, the trust, respect, and autonomy support that teachers who foster such relationships afford may buffer students against anxiety and motivate them to engage in physical activities (Guo et al., 2025). It is also indicated in con-text related studies that teacher support has a positive influence on student engagement (Zhang et al., 2024), let alone the studies in physical education. In the context of Chinese universities, where PE classes are large and standardized, teacher support might be critical to catering to different levels of student ability and motivation.

Although a direct association between teacher support and student engagement has been established, the psychological processes of how and why teacher support influences student motivation and engagement have received increasing attention. Among them, so far, student self-efficacy is the most widely supported construct. Based on Bandura's social cognitive theory, perceived self-efficacy is defined as individuals' beliefs toward their capabilities of organizing and executing course of actions necessary to attain designated types of performances or outcomes (Waddington, 2023). In the context of physical education (PE), self-efficacy can be described as the degree to which a student believes he or she can successfully accomplish a physical task, learn a new skill, or meet a physical challenge (Raven & P els, 2021). Elevated self-efficacy has consistently been associated with increased effort, perseverance, and participation in physical activity and PE learning.

Teacher support is one of the most important antecedents of self-efficacy, since teachers act as a source of verbal persuasion, provide feedback on

performance, and offer learning experiences oriented toward mastery that influence students' competence beliefs (Liu et al., 2023). Students also tend to gain higher levels of physical self-confidence (PSC) and subsequently increase level of physical activity (PA) when they feel supported by their physical education (PE) teachers (Zalech, 2021). Prior research in general education and sport psychology has revealed that self-efficacy acts as a mediator for the relationship between supportive teaching behaviors and student engagement or performance outcomes (Li & Zeng, 202). Nonetheless, research investigating such mediating process in Chinese university PE settings is scarce.

Under the background, the study takes Jining Normal University undergraduates as the research participants to discuss the correlations among teacher support, student self-efficacy, and student engagement in PE. In view of self-efficacy as a mediator, the study aims to disclose the psychological mechanism of teacher support on student engagement in PE classes. The results will help add to the existing literature by expanding engagement research to a university PE context, and providing practical information to PE instructors on how to increase student participation and their learning experiences through supportive teaching methods.

2. Research objectives

The study investigates the impact of teacher support on student engagement in university physical education from the perspective of self-efficacy among undergraduates in China, classes and participation at Jining Normal University.

RO1: To investigate the effect of teacher support on student engagement among

undergraduates in physical education at Jining Normal University.

RO2: To investigate the effect of teacher support on student self-efficacy among undergraduates in physical education at Jining Normal University.

RO3: To investigate the effect of self-efficacy on student engagement among undergraduates in physical education at Jining Normal University.

RO4: To determine whether student self-efficacy mediates the effect of teacher support on student engagement in physical education for undergraduates at Jining Normal University.

3. Research questions

In accordance with the formulated objectives, the present study posits the following research questions to investigate systematically the teacher support, students' self-efficacy and student engagement in university physical education.

RQ1: What is the influence of teacher support on student engagement among undergraduates in physical education at Jining Normal University?

RQ2: What is the influence of teacher support on student self-efficacy among undergraduates in physical education at Jining Normal University?

RQ3: What is the influence of student self-efficacy on student engagement among undergraduates in physical education at Jining Normal University?

RQ4: Does student self-efficacy mediate the relationship between teacher support and student engagement among undergraduates in physical education at Jining Normal University?

4. Research hypothesis

Based on social cognitive theory and prior empirical studies on teacher support, self-efficacy, and student engagement, this study proposes a set of hypotheses. These hypotheses specify the direct relationships among the variables and the mediating role of student self-efficacy in university physical education.

H1: Teacher support significantly influences student engagement among undergraduates in physical education at Jining Normal University.

H2: Teacher support significantly influences student self-efficacy among undergraduates in physical education at Jining Normal University.

H3: Student self-efficacy significantly influences student engagement among undergraduates in physical education at Jining Normal University.

H4: Student self-efficacy mediates the relationship between teacher support and student engagement among undergraduates in physical education at Jining Normal University.

5. Literature review

(1) Previous studies on teacher support

Prior studies have highlighted teacher support as an important contextual aspect influencing student engagement and learning outcomes; however, a growing number of studies also reveal novel findings on its effects. In a large-scale meta-analysis of 71 empirical studies, Tao et al. (2022) present strong evidence that perceived teacher support is positively related to academic achievement, and student engagement serves as a partial mediator. The major strength of the study is its integrative nature that is based in theory, namely the self-system process model. Still, the

observed effect size ($r = 0.16$) is small which may indicate that teacher support in isolation is not enough to have a large positive impact on achievement, and that its impact may vary depending on such factors as the developmental level, the type of support, and the outcome considered.

With the aim of deepening students' understanding of the subject matter, Shao et al. (2025) employ a moderated mediation model to explore the psychological processes that connect teacher support to learning engagement in a sample of adolescents from secondary schools. Results indicate that academic self-efficacy and psychological resilience played a mediating role, while positive academic emotion as a moderator. This study advances the literature by bringing together self-determination theory with emotion regulation theory, but the cross-sectional nature of the study limits causal conclusions and its generalizability is limited by the fact that it was conducted with Chinese secondary school students.

In contrast to the above findings, Alrashidi & Alshammari (2025) found a non-significant influence of teacher support on student engagement in online EFL courses, highlighting the context-dependent nature of teacher support. Although this finding contrasts traditional beliefs, the small size of the sample and the fact that the study was conducted solely in online learning environments implies that the results must be interpreted with caution. These studies suggest that the effect of teacher support is not straightforward but complex, context-dependent, and influenced by psychological resources of students.

(2) Previous studies on student self-efficacy

A growing number of empirical studies

consider student self-efficacy as a key psychological mechanism that connects instructional, cognitive, and emotional factors to student outcomes, with some differences in theoretical emphasis and methodological stringency. Asare et al. (2025) apply a cognitive-affective approach, as they investigate the mediational effect of student self-efficacy between cognitive awareness and mathematics achievement, with math anxiety as moderator. This investigation with a relatively large undergraduate sample using SEM, provides strong statistical evidence for partial mediation. Yet this study's design is cross-sectional, limiting causal inference, and the positive moderating finding of math anxiety in the link between cognitive awareness and performance needs further theoretical justification, since anxiety is more often conceptualized in literature as a debilitating agent.

Lera et al. (2023) contribute to student self-efficacy literature by addressing student well-being in addition to academic achievement and using multilevel SEM. The differentiation of individual- and class-level effects, also considered a methodological strength, shows that self-efficacy is not only an individual belief but a shared resource in the classroom. However, the reliance on self-report measures may inflate correlations as a result of common method bias.

Wang et al. (2023) located student self-efficacy in a social-contextual perspective and examined its mediating role between teacher leadership and academic motivation in the context of Chinese higher education. Although the study increases cultural relevance, the motivation (rather than performance) orientation limits the range of outcome interpretation. These studies confirm student self-efficacy as an important mediating construct but underscore the need for longitudinal

and multi-source designs to enhance the explanatory power.

(3) Previous studies on student engagement

A number of empirical studies have highlighted student engagement as the key process through which educational environments influence student outcomes, although these studies vary in theoretical perspective, contextual setting, and methodological design. Irshad et al. (2023) explored student engagement at the level of institution and found that the organizational climate in the private universities of Karachi has positive significant impact on student engagement and learning outcomes. Although this investigation used strong evidence based on PLS-SEM and a multi-institutional sample, the focus on structural and environmental variables does not facilitate a deeper understanding of the psychological or relational processes by which engagement is nurtured.

Out of this macro-level view, Sultana & Wahid (2023) zoomed into the mind of a student and explored academic psychological capital, centering on self-efficacy and resilience. Findings suggest that the influence of these internal resources on student engagement is to some extent mediated by faculty support, suggesting a combination of intrapersonal and interpersonal factors. However, findings need to be interpreted with caution because of the limitations of a single-institution sample and cross-sectional study design.

At the micro-interactional level, Li (2023) investigated the engagement of Chinese students in foreign language learning from the perspectives of teacher-student relationships, growth mindset, and foreign language enjoyment. This study contributes to the literature on engagement by

introducing emotional and motivational intermediaries, although its domain-specific nature may hamper its applicability to other educational contexts. These findings point to student engagement as a product of institutional climate, psychological capital, and relational-emotional dynamics, highlighting a need for integrative models that connect the structural, interpersonal, and intrapersonal levels.

6. Methodology

(1) Population and sample

The participants included full-time undergraduate students at Jining Normal University. In total, the enrolment of undergraduates in the university as of November 2025 was 11,141 students, involving in diverse grades, majors as well as PE curriculum schedule. The sample size was calculated with the help of the Raosoft sample size calculator with confidence level of 95% and margin of error of 5%. The necessary sample size is 372 respondents. Statistical power was improved and non-response was accounted for, as well as sufficient representation of all subgroups, so the final sample size was increased to 400 students.

A simple random sampling method was used to choose the participants. Such method allows to ensure that each undergraduate has the same chance to be part of the research and it fits the reduce of sampling bias and increase the findings generalization within the context of the university. The students chosen were those taking compulsory university PE courses at the time, so that the experiences recounted were as close as possible to current teaching practice.

(2) Research instrument

Data was collected through a structured self-

administered questionnaire. The items of the scale were rated on a five-point Likert scale where 1 (strongly disagree) and 5 (strongly agree). Teacher support was assessed with a scale based on Zhang (2025) which treats teacher support as a complex construct including emotional, pedagogical and instrumental support. Emotional support is comprised of teachers' care, encouragement and respect; pedagogical support is related to instructional processes and feedback; and instrumental support implies the supply of resources and help. The scale contained 15 items and they showed good reliability and validity in previous researches.

Student self-efficacy was measured with a scale adapted from Vonitasari & Amir (2025). Based on Bandura's social cognitive theory, this scale assesses student self-efficacy in three dimensions, including magnitude, strength and generality, as students' perceived ability to accomplish PE-related activities at different levels of difficulty and in different situations. This 21-item scale was selected because it had a clear theoretical basis and was relevant to the context of learning.

Student engagement was assessed and adapted from the scale of Hasanov et al. (2021), which accounts behavioral, cognitive, and emotional engagement. Behavioral engagement is defined as students participating in PE activities; cognitive engagement is associated with students' investment in their learning and level of persistence; emotional engagement is students' interest and enjoyment in PE class. This scale consists of 18 items and has been frequently used in the study of higher education.

(3) Data analysis techniques

Data analysis in this study was conducted through SPSS 27.0 and AMOS 28.0. SPSS was used for data screening and preliminary analysis to identify whether there were any missing values or outliers and to test the normality of the data using descriptive statistics including means, standard deviations, skewness and kurtosis. The internal reliability of all the measurement scales was tested with Cronbach's alpha and the alpha coefficients above 0.70 were considered to have acceptable reliability. Then, CFA was performed in AMOS to test the validity of the measurement model by evaluating standardized factor loadings, composite reliability (CR), and average variance extracted (AVE) to confirm convergent validity, and discriminant validity was tested based on the Fornell-Larcker criterion. When satisfactory measurement quality was attained, SEM path analysis was used to test the hypothesized direct effects between teacher support, student self-efficacy, and student engagement in AMOS. The linking effect of student self-efficacy as a mediator was tested with bootstrapping method with 5,000 resamples, yielding bias-corrected confidence intervals for indirect effects.

7. Results

(1) Reliability and validity results

Before testing the hypotheses, the reliability and validity of the instruments were assessed in order to be confident in the findings of the study. The internal consistency reliability was initially

tested by using the value of the Cronbach's α coefficients. The findings show that all constructs, namely teacher support, student self-efficacy and student engagement had Cronbach's alpha values greater than the recommended value of 0.70, indicating good internal consistency. This means that items in each scale are such that they appear to consistently tap the same latent construct.

Convergent validity was assessed by CFA using standardized factor loadings, composite reliability (CR) and average variance extracted (AVE). All standardized factor loadings were significant and exceeded recommended cut-off values, which indicated strong item-construct associations. The CR values for the constructs were all above 0.70 and the AVE values were above the suggested value of 0.50, indicating sufficient convergent validity. Discriminant validity via the Fornell-Larcker criterion was also confirmed as the square roots of AVE of each construct is greater than the inter-latent correlations suggest that each construct is more strongly related with its own indicators than with other constructs. These results confirm that the measurement model has acceptable reliability and validity of constructs.

After acceptable levels of reliability and validity were established, AMOS was used to perform structural equation modeling to test for the proposed relationships among the constructs. The results of SEM path analyses are shown in Table 1.

Table 1 SEM path analysis results

Path	Estimate	S.E.	C.R.	P-value	Std Path coefficient
TS--->STE	0.638	0.053	12.038	***	0.525
TS--->SSE	0.591	0.042	14.071	***	0.476
SSE--->STE	0.604	0.048	12.583	***	0.499

Note: teacher support (TS), student self-efficacy (SSE), student engagement (STE)

The results of path analysis based on SEM offered robust empirical evidence for the hypothesized associations between teacher support, student self-efficacy, and student engagement in university PE. As indicated in Table 1, teacher support significantly and positively predicted student engagement ($\beta=0.525$, $p<.001$), suggesting that undergraduates are more likely to participate actively, exert efforts, and have positive emotional experience in PE courses when PE teachers care for, offer instruction-related help, and address the needs of students. A positive relationship was also found between teacher support and student self-efficacy ($\beta=0.476$, $p<0.001$), indicating that students' self-efficacy, or belief in their ability to

perform physically and overcome PE-related difficulties, is strengthened through teacher supportive behaviours. Furthermore, student self-efficacy significantly influences student engagement ($\beta=0.499$, $p<0.001$), thereby emphasizing self-efficacy as a salient psychological antecedent to continuously investing efforts in physical education. The significance of all standardized path coefficient was large with high critical ratio indicating that all direct hypotheses (H1-H3) are supported.

To further investigate the psychological process involved, bootstrapping was used to examine the mediating role of student self-efficacy between teacher support and engagement in the study. The results of the mediation analyses are shown in Table 2.

Table 2 Mediating effect analysis results of student self-efficacy

Standard effect	Path	Effect coefficient	95% confidence interval		S.E.	P-value
			Lower	Upper		
Total effect	TS--->STE	0.763	0.714	0.812	0.025	***
Direct effect	TS--->STE	0.525	0.482	0.568	0.022	***
Indirect effect	TS--->SSE--->STE	0.238	0.201	0.275	0.019	***

Note: teacher support (TS), student self-efficacy (SSE), student engagement (STE)

The analysis of mediating effects illustrates that student self-efficacy significantly mediates the effect of teacher support on student engagement in university physical education. As displayed in Table 2, the total effect of teacher support on student engagement is significant ($\beta=0.763$, $p<.001$), suggesting that teacher support is a strong predictor of student engagement among indirect and direct effects. Effects of teacher support on

student engagement were significant even when student self-efficacy was entered in the model ($\beta=0.525$, $p<.001$), and the indirect effect of teacher support on student engagement through student self-efficacy was also significant ($\beta=0.238$, $p<.001$). The 95% bias-corrected confidence interval for the indirect effect does not contain zero, indicating that the mediation effect is robust. These findings were indicative of partial mediation, that is to say, teacher support positively predicts student engagement both directly and indirectly via the students' beliefs about their ability to execute and

persist on physical education related activities, thus the findings lend support to Research Hypothesis 4 (H4).

8. Discussions of findings

The study aims to examine the relationships among teacher support, student self-efficacy, and student engagement in university physical education, as well as to test the mediating role of student self-efficacy among undergraduates at Jining Normal University. The findings provide strong empirical support for the proposed research model and are consistent with prior theoretical assumptions and empirical evidence in educational psychology and physical education research.

The results provide evidence that teacher support is a positive predictor of student engagement in physical education, confirming Hypothesis 1. This result is consistent with much research indicating that if students regard their teachers as being caring, attentive to need and supportive, then they have a greater likelihood of being involved in learning activities (either behaviorally active or emotionally actively) and they usually have more positive emotional attachment. Consistent with the meta-analytic results of Prananto et al. (2025), teacher support is indeed important in engagement promotion, although the strength of the relation between these two variables found in previous studies appears to fluctuate. In the PE context, where students commonly feel nervous, physically uncomfortable, or lack intrinsic motivation, teacher support may be vital for keeping them engaged (Tanaka & Peck, 2021). The findings add to prior research, indicating that the significance of teacher support can be generalized to a Chinese university PE context, where large classes and standardized curricula may make individualized teaching more

challenging.

The results showed that teacher support positively affected student self-efficacy, which supported Hypothesis 2. This finding is consistent with Bandura's social cognitive theory which highlights the importance of social persuasion, feedback and vicarious experience in the formation of Personal Efficacy beliefs. Similarly to the results of Huang & Wang (2023) revealing that teacher support positively predicts the motivational beliefs of students at university level, this study reveals that PE teachers' support, advice and how they instruct students in carrying out physical activity influence how confident these adolescents feel about their physical competence. This indicates that teacher support not only influence observable manifestations of engagement such as student behavioral engagement, but also enhances internal psychological capital, which has been proved to be crucial to learning and perseverance in physically challenging environment.

Student self-efficacy has a strong positive influence on student engagement in physical education, affirming the hypothesis 3. This result is in line with previous studies, establishing self-efficacy as a salient indicator for exertion, perseverance, and active participation in learning and physical activity (Sökmen, 2021). Students with a strong belief in their ability to successfully perform PE tasks will be more motivated, they are more likely to persist in the face of difficulties and on-task in the face of distractions, and they tend to have more positive affective experiences in the classroom. Consistent with Singh & Abdullah (2020), these findings further solidify the perspective that self-efficacy serves as a pivotal motivational construct that converts an individual's felt competence into sustained activity engagement,

more so in situations that entail the acquisition of physical skill and stamina.

The mediating analyses demonstrate that student self-efficacy serves as a partial mediator of the association between teacher support and student engagement, thereby supporting Hypothesis 4. This finding aligns with previous mediation and moderated mediation research that highlight indirect routes through which teaching support is associated with engagement-related outcomes (Yang et al., 2023). The positive indirect effect suggests that support from teachers increases engagement in students not simply as a consequence of a direct interpersonal effect but also by promoting their beliefs about their physical competence. This finding is consistent with the self-system process model, which proposes that contextual supports influence engagement via multiple self-perceptions and motivational processes.

9. Conclusion

This study explored the relationships between

teacher support, student self-efficacy, and student engagement in university physical education under the mediating effect of self-efficacy in the sample of undergraduate students from Jining Normal University. These results provide compelling empirical support that teacher support predicts student engagement in PE both positively and indirectly by increasing student self-efficacy. The confirmation of partial mediation indicates that student self-efficacy is an important psychological mechanism by which teacher support leads to continued student engagement. The findings contribute to the existing engagement and self-efficacy literature by framing the hypothesized relationships in a Chinese university PE context and indicate the utility of supportive instructional environments. The study has implications for PE teachers and university managers, advocating that they focus on teacher support practice that fosters students' belief in their capabilities as learners and in the PE curriculum, to facilitate learner engagement, and thus learner-centeredness, and meaningful learning in the subject.

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