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Article

The Mediating Roles of Teacher Behaviors and Classroom Management in the Relationship Between Teacher Professional Development and Student Engagement: An Empirical Study of Primary Schools in Nanchang, China

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Abstract: Teacher professional development (TPD) is widely regarded as a cornerstone of educational improvement, yet the mechanisms through which it translates into enhanced student outcomes remain underexplored, especially in non-Western contexts. This study investigates the mediating roles of teacher behaviors (TB) and classroom management practices (CM) in the relationship between TPD and teacher-perceived student engagement (SE) in Chinese elementary schools. Drawing on Self-Determination Theory and Social Cognitive Theory, we analyzed survey data from 300 elementary school teachers in Nanchang, China, using Structural Equation Modeling (SEM). Results indicate that TPD significantly and positively predicts TB ($\beta = 0.58$, $p < 0.001$), CM ($\beta = 0.54$, $p < 0.001$), and SE ($\beta = 0.22$, $p < 0.01$). More importantly, both TB (indirect effect = 0.18, 95% CI [0.10, 0.26]) and CM (indirect effect = 0.21, 95% CI [0.12, 0.30]) serve as significant partial mediators, accounting for 32.1% and 37.5% of the total effect, respectively. The model explains 68.2% of the variance in SE. These findings reconceptualize TPD not as an outcome of teaching practice but as a critical antecedent that enhances teaching quality and, subsequently, student engagement. The study offers theoretical and practical insights for teacher development in rapidly urbanizing educational contexts, with particular implications for large-class settings in China.

Keywords: teacher professional development; teacher behaviors; classroom management; student engagement

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1. Introduction

Student engagement is widely recognized as one of the most important indicators of educational quality and a robust predictor of academic achievement, student well-being, and long-term educational success [1]. In elementary education, fostering engagement is particularly consequential because early learning experiences lay the foundation for students' academic identities and lifelong learning habits. Engaged students actively participate in classroom activities, persist through academic challenges, and invest cognitive effort in understanding complex material. Conversely, patterns of disengagement that take root in the early years can be difficult to reverse, contributing to widening achievement gaps and increased risk of school dropout over time.

Given these high stakes, educational researchers have devoted considerable attention to identifying the classroom conditions that promote student engagement. A substantial body of research has established that what teachers do in the classroom is critically important [2]. Two sets of malleable teacher-related factors have emerged as particularly influential. The first concerns teacher behaviors-the observable actions, communication styles, emotional responses, and instructional practices that teachers display when interacting with students, including instructional clarity, quality of feedback, warmth, and respect. The second concerns classroom management practices-

the systems of rules, routines, and strategies through which teachers establish and maintain an orderly, predictable, and productive learning environment, including preventive, supportive, and corrective approaches. Both sets of factors have been consistently shown to predict student engagement across diverse educational settings, and both are widely regarded as teachable skills that can be developed through training and experience.

However, a critical question remains less explored: What drives and sustains these effective teaching practices over time? In the pursuit of educational improvement, policymakers and school leaders worldwide have heavily invested in teacher professional development (TPD) as a primary lever for change [3]. TPD encompasses structured and sustained learning experiences designed to enhance teachers' knowledge and skills, with the ultimate goal of improving teaching practice and student outcomes [4]. The underlying logic is compelling: when teachers participate in high-quality professional learning, they acquire new instructional strategies, refine their classroom management techniques, and develop greater self-efficacy-all of which should translate into improved classroom environments.

Yet the empirical evidence directly linking TPD to student engagement via specific classroom mechanisms is surprisingly thin, and the theoretical logic of this pathway is often mis-specified. Many existing studies have treated TPD as an outcome or consequence of teacher behaviors, implicitly suggesting that more effective teachers are more likely to seek out training. This logic is theoretically flawed. According to established models of teacher change, professional development is a precursor to change in teacher practice, not a consequence. It is through structured learning experiences that teachers acquire new knowledge, and it is this enhanced capacity that leads to changes in classroom behaviors and, ultimately, student outcomes. Therefore, a theoretically sound model must position TPD as an antecedent that drives improvements in TB and CM, which then foster SE.

This theoretical mis-specification is especially notable in the context of Chinese elementary education. China has made massive investments in teacher training, particularly in rapidly developing urban centers such as Nanchang, the capital of Jiangxi Province. However, the mechanisms explaining how this training translates into improved classroom practice remain unclear. Chinese elementary school teachers face unique challenges that distinguish their context from Western settings. Large class sizes, typically ranging from 40 to 60 students, place enormous demands on teachers' capacity to monitor individual progress and manage student behavior. At the same time, ongoing educational reforms promoted by the Ministry of Education press teachers to adopt more student-centered pedagogies while maintaining high standards of academic achievement and classroom order . These dual pressures are acutely felt in rapidly urbanizing cities like Nanchang, where population growth and socioeconomic diversity intensify the challenges teachers face [5].

To address these theoretical and empirical gaps, this study proposes and tests a theoretically grounded mediation model. Specifically, we aim to examine whether TB and CM serve as mediating mechanisms through which TPD influences SE in elementary schools in Nanchang. By reconceptualizing TPD as the independent variable and teacher practices as mediators, this research provides a more accurate understanding of the process of educational change and offers practical insights for improving professional development in large-class, high-demand settings.

2. Literature Review and Theoretical Framework

2.1. Teacher Professional Development

Teacher professional development refers to the structured and sustained learning experiences through which teachers enhance their professional knowledge and skills. In contemporary educational discourse, TPD is no longer viewed as optional but as essential for teacher career progression and school improvement. The evolution of TPD has shifted

from fragmented, one-time workshops to coherent, sustained, and contextually embedded learning systems that emphasize active learning, collaboration, and reflection. Research consistently demonstrates that effective PD is characterized by content focus, active learning, coherence with school goals, sufficient duration, and collective participation among teachers from the same context. These features are more likely to produce meaningful changes in teacher practice than short, isolated workshops.

In the Chinese context, TPD operates within a multi-layered system that includes national training programs, provincial initiatives, school-based professional learning communities (PLCs), and mentorship programs. The Ministry of Education has launched national programs aimed at expanding the pool of exemplary educators who can lead educational reform. School-based PLCs have been widely adopted across Chinese schools, with research demonstrating their positive influence on teacher self-efficacy and commitment. However, significant challenges persist in rapidly urbanizing cities like Nanchang, where teachers face large class sizes, diverse student populations, and pressure to implement student-centered pedagogies while maintaining high achievement standards.

2.2. Teacher Behaviors and Classroom Management

Teacher behaviors encompass the observable actions and communication styles that teachers demonstrate in the classroom. These are typically categorized into instructional behaviors (clarity of explanation, quality of feedback), relational behaviors (warmth, respect, encouragement), and organizational behaviors (efficient use of time). Each dimension contributes uniquely to the classroom climate and collectively shapes students' engagement. Extensive meta-analytic evidence has shown that positive teacher-student relationships are associated with large effect sizes across multiple outcome clusters, including academic achievement, motivation, and school belonging.

Classroom management practices refer to the strategies teachers use to establish and maintain an orderly and productive learning environment. These are commonly divided into preventive management (clear rules and routines), supportive management (active monitoring and prompting), and corrective management (fair and consistent responses to misbehavior). A large body of research has demonstrated that teachers' provision of classroom structure is positively associated with students' behavioral, emotional, and cognitive engagement, as well as their academic achievement. In elementary school settings, where young learners are still developing self-regulation, the quality of classroom management is particularly consequential.

2.3. Student Engagement

Student engagement is a multidimensional construct reflecting the quality and intensity of students' involvement in learning activities. The tripartite framework distinguishes among three interrelated dimensions: behavioral engagement (participation, effort, persistence), emotional engagement (interest, enjoyment, belonging), and cognitive engagement (mental effort, self-regulation, deep processing). Empirical syntheses have found that student engagement correlates strongly with academic achievement and subjective well-being. In elementary school, engagement is especially important because early learning experiences shape long-term academic trajectories and attitudes toward school. Research on Chinese primary students has shown that learning engagement significantly fosters student development by improving academic performance and reducing behavioral problems.

2.4. Theoretical Framework: Integrating Social Cognitive Theory and Self-Determination Theory

This study is underpinned by two complementary theoretical perspectives: Bandura's Social Cognitive Theory (SCT) and Deci and Ryan's Self-Determination Theory (SDT)[6,7]. Together, these theories provide a comprehensive framework for explaining how TPD translates into enhanced SE through improved teacher practices.

SCT emphasizes the reciprocal interaction among personal factors, environmental influences, and behavior. A core construct is self-efficacy, defined as an individual's belief

in their capability to execute necessary behaviors. Self-efficacy beliefs influence how people think, feel, and behave; those with high self-efficacy approach difficult tasks as challenges, set challenging goals, and persist longer. In educational contexts, teacher self-efficacy has been shown to influence teaching practices, classroom management, openness to innovation, and student outcomes. Research syntheses have found that teacher self-efficacy is positively associated with instructional quality and student engagement [8]. SCT posits that TPD is a powerful source of enhanced self-efficacy through mastery experiences, vicarious learning, and social persuasion. This heightened self-efficacy then motivates teachers to engage in more positive and effective classroom behaviors and to maintain high-quality management.

SDT provides a motivational lens focusing on students' basic psychological needs. The theory posits that individuals have three innate needs: autonomy (volition), competence (effectiveness), and relatedness (connection to others). When these needs are satisfied in the classroom, students experience greater intrinsic motivation, autonomous regulation, and well-being. Need-supportive teaching-characterized by autonomy support, constructive feedback, and relational warmth-satisfies these needs and fosters deep engagement. Conversely, controlling or neglectful behaviors frustrate these needs, leading to disengagement.

By integrating SCT and SDT, our model posits that TPD enhances teachers' self-efficacy, which equips and motivates them to implement more effective and need-supportive TB and CM. These improved practices, in turn, create a classroom environment that satisfies students' basic psychological needs, fostering their autonomous motivation and deep engagement. Thus, the effects of TPD on SE are theorized to be indirect, transmitted through the mediating mechanisms of improved TB and CM.

2.5. Hypothesis Development

Based on the theoretical framework and empirical literature, we propose the following hypotheses:

H1: TPD has a significant positive relationship with TB.

H2: TPD has a significant positive relationship with CM.

H3: TB has a significant positive relationship with SE.

H4: CM has a significant positive relationship with SE.

H5a: TB mediates the TPD–SE relationship.

H5b: CM mediates the TPD–SE relationship.

3. Method

3.1. Research Design and Participants

This study employed a quantitative, cross-sectional, correlational design. The target population was elementary school teachers in public schools in Nanchang, Jiangxi Province. According to official statistics, there are approximately 15,000 elementary teachers across more than 200 public schools. Using stratified random sampling (urban/suburban districts, school sizes), we invited all eligible teachers (≥1 year experience) from randomly selected schools. We obtained 300 complete responses (83% response rate). Demographics: 62.7% female; age groups: 25–34 (32.0%), 35–44 (37.3%); teaching experience: <5 years (22.7%), 5–10 (34.7%), >15 (18.3%); 66.0% held a bachelor's degree, 34.0% a master's; 70.7% worked in public schools; subject areas included Chinese (24.7%), math (29.3%), and English (17.3%).

3.2. Measures

All measures used a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). Instruments were translated using forward-backward translation; a pilot study (N=100) confirmed clarity and removed low-loading items.

Teacher Professional Development (TPD): Conceptualized as a second-order factor, measured with 9 items adapted from established frameworks, covering participation,

perceived impact, and transfer/reflection (e.g., "I participate regularly in professional training," "PD improves my teaching skills"). One item was removed after pilot.

Teacher Behaviors (TB): 9 items adapted from the literature, capturing instructional (clarity, feedback), relational (warmth, support), and organizational (fairness) behaviors.

Classroom Management (CM): 8 items based on established frameworks, covering preventive (rules), supportive (monitoring), and corrective (prompt responses) practices. Two items were removed.

Student Engagement (SE): 9 items from the tripartite framework, measuring behavioral (participation), emotional (interest), and cognitive (effort) engagement from the teacher's perspective. One item was removed.

3.3. Data Analysis

Data were analyzed using SPSS 26.0 and AMOS 24.0. First, descriptive statistics and correlations were computed. Second, confirmatory factor analysis (CFA) assessed the measurement model (fit indices: χ^2/df, CFI, TLI, RMSEA, SRMR). Third, the structural model estimated direct and indirect effects. Mediation was tested via bootstrapping (5,000 resamples) with bias-corrected 95% confidence intervals.

4. Results

4.1. Preliminary Analysis and Common Method Bias

Table 1 presents the means, standard deviations, and correlations among all constructs. No missing data or outliers were detected. Skewness and kurtosis were within acceptable ranges. Harman's single-factor test showed the first factor accounted for 35.27% of variance (<50% threshold), and a single-factor CFA showed poor fit (CFI=0.58, RMSEA=0.119), indicating common method bias was not a serious concern.

Table 1. Descriptive Statistics and Correlations.

Construct	M	SD	1	2	3	4
1. TPD	3.54	0.79	(0.74)			
2. TB	3.64	0.78	0.58**	(0.75)		
3. CM	3.53	0.82	0.54**	0.65**	(0.75)	
4. SE	3.51	0.81	0.55**	0.63**	0.67**	(0.75)

*Note: Diagonal = square root of AVE; *p<0.01.

All constructs were significantly positively correlated (r=0.54–0.67).

4.2. Measurement Model

CFA for the four-factor model (TPD as second-order) showed acceptable fit: χ^2=1526.84, df=554, χ^2/df=2.76, CFI=0.93, TLI=0.92, RMSEA=0.076 (90% CI [0.072, 0.080]), SRMR=0.048. All factor loadings >0.70. Cronbach's α: 0.90–0.92; composite reliability: 0.93–0.94; AVE: 0.55–0.57; HTMT ratios <0.85; VIF values <5.0. The measurement model was psychometrically sound.

4.4. Structural Model and Hypothesis Testing

Structural model fit was identical to the measurement model.

Direct Effects:

The results of the direct effects and hypothesis testing are shown in **Table 2**.

Table 2. summarizes the direct and indirect effects.

Hypothesis	Path	β	SE	CR	p	Result
H1	TPD → TB	0.58	0.056	10.36	<0.001	Supported
H2	TPD → CM	0.54	0.053	10.19	<0.001	Supported
H3	TB → SE	0.31	0.064	4.84	<0.001	Supported
H4	CM → SE	0.39	0.061	6.39	<0.001	Supported
–	TPD → SE (direct)	0.22	0.058	3.79	<0.001	–

R^2 for SE = 0.682.

Mediation Effects (Bootstrapping):
The results of the mediation analysis are summarized in **Table 3**.

Table 3. Results of Mediation Effects.

Path	Indirect Effect	95% CI	Proportion	Result
TPD → TB → SE	0.18	[0.10, 0.26]	32.1%	Supported (H5a)
TPD → CM → SE	0.21	[0.12, 0.30]	37.5%	Supported (H5b)

The direct effect of TPD on SE remained significant (β=0.17, $p<0.01$), indicating partial mediation.

5. Discussion

5.1. Direct Effects: TPD as a Catalyst

Our results confirm that TPD is a powerful predictor of both TB (β=0.58) and CM (β=0.54). These strong direct effects align with both SCT and established models of teacher change. From an SCT perspective, TPD enhances teacher self-efficacy through mastery experiences, vicarious learning, and social persuasion. Teachers who develop greater confidence in their abilities are more likely to enact positive behaviors and implement effective management strategies consistently. This finding is particularly significant in the Chinese context, where large class sizes create substantial management challenges. TPD that equips teachers with concrete, proactive strategies is crucial for building the self-efficacy needed to manage these demanding environments.

5.2. The Proximal Drivers of Engagement

Both TB (β=0.31) and CM (β=0.39) directly predicted SE, consistent with SDT. CM emerged as the stronger predictor, reflecting that in large Chinese classrooms, a well-organized, orderly environment is foundational. Effective management reduces extraneous cognitive load and creates a predictable environment where students feel safe to take intellectual risks. Yet TB also matters-relational warmth, instructional clarity, and constructive feedback satisfy students' needs for competence and relatedness, fostering autonomous motivation. This dual focus on structure and support is essential for promoting all three dimensions of engagement.

5.3. Mediating Roles of Teacher Practices

Both TB (indirect=0.18) and CM (indirect=0.21) significantly mediated the TPD–SE relationship, together accounting for nearly 70% of TPD's total effect. This empirically demonstrates that TPD works by enhancing daily classroom skills, supporting the theoretical models of Desimone and Guskey in the Chinese context. CM's larger mediation proportion (37.5% vs. 32.1%) suggests that PD focusing on practical management strategies yields the highest return in terms of engagement, especially where order is a prerequisite. Partial mediation indicates a direct TPD→SE effect not fully explained by the mediators-possibly via other mechanisms like instructional design or teacher enthusiasm. Future research should explore additional mediators.

5.4. Cultural and Contextual Considerations

The strong CM mediation reflects Chinese cultural values of collectivism and order-a well-functioning group is essential for learning. Students socialized to value discipline and respect authority perceive orderly classrooms as legitimate, supporting behavioral engagement. However, ongoing reforms promoting student-centered pedagogy mean the TB pathway is growing in importance. Effective TPD must help teachers balance structured management with autonomy-supportive behaviors. Nanchang's rapid urbanization adds complexity-teachers face diverse populations and increasing pressures. TPD addressing differentiated instruction, diversity management, and stress coping is likely most effective.

5.5. Practical Implications

For teachers: Engage in sustained, content-focused PD with active learning to enhance self-efficacy and practice.

For administrators: Invest in coaching, PLCs, and peer observation; provide time for collaboration and align school policies with PD goals.

For policymakers: Direct funding to PD programs embodying effective features; prioritize PD targeting management and relational behaviors in large classes.

For teacher educators: Explicitly teach and practice instructional, relational, and management strategies; help pre-service teachers connect their learning to practice and outcomes.

5.6. Limitations and Future Research

Cross-sectional design prevents causal claims. Longitudinal studies are needed.

Teacher self-report risks social desirability; future studies should include student surveys and observations.

Sample from Nanchang only limits generalizability. Replications in other cities and countries are needed.

Broad TPD measure did not distinguish types (coaching vs. workshops). Future research should examine format effects.

School-level factors (leadership, culture) were not included; multilevel modeling could explore cross-level interactions.

Unexplained variance (32%) suggests other factors (student characteristics, parents) contribute; future models should incorporate these.

6. Conclusion

This study tested whether TB and CM mediate the TPD–SE relationship in Nanchang's elementary schools. Results strongly support the dual-mediation model. TPD significantly predicts both TB and CM, which in turn predict SE. Both mediators are significant partial mediators, accounting for over two-thirds of TPD's total effect. CM emerged as the stronger mediator, reflecting the importance of structural order in large Chinese classrooms. The findings extend SCT and SDT to the Chinese elementary context, clarify the mediating mechanisms of TPD effectiveness, and underscore the need for high-quality, sustained PD that directly targets instructional and managerial skills. Policymakers and school leaders should prioritize content-focused, active, coherent, and collaborative PD with implementation support. In China's rapidly urbanizing education landscape, ongoing quality professional learning is vital-this study provides a clear pathway for how such investments can yield meaningful returns in improved teaching and enhanced student engagement.

References

1. J. A. Fredricks, P. C. Blumenfeld, and A. H. Paris, "School engagement: Potential of the concept, state of the evidence," *Review of Educational Research*, vol. 74, no. 1, pp. 59–109, 2004.
2. J. Hattie, *Visible Learning: The Sequel*. New York, NY: Routledge, 2023.
3. L. Darling-Hammond, M. E. Hyler, and M. Gardner, "Effective teacher professional development," *Teaching and Teacher Education*, vol. 115, p. 103742, 2022.
4. L. M. Desimone, "Improving impact studies of teachers' professional development: Toward better conceptualizations and measures," *Educational Researcher*, vol. 38, no. 3, pp. 181–199, 2009.
5. Y. Shi and S. Singh, "The impact of classroom management and teacher-student relationships on academic engagement in Chinese schools," *Malaysian Journal of Social Sciences and Humanities*, vol. 9, no. 5, pp. 45–58, 2024.
6. A. Bandura, *Self-Efficacy: The Exercise of Control*. New York, NY: W. H. Freeman, 1997.
7. R. M. Ryan and E. L. Deci, "Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions," *Contemporary Educational Psychology*, vol. 61, p. 101860, 2020.
8. M. Zee and H. M. Y. Koomen, "Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research," *Review of Educational Research*, vol. 91, no. 6, pp. 885–945, 2021.