

THE IMPACT OF TEACHING FACULTY'S MENTORING ENGAGEMENT AND CLASSROOM EDUCATIONAL MANAGEMENT AT S UNIVERSITY IN SICHUAN PROVINCE, CHINA

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Abstract

This research aims to examine the influence of faculty mentoring engagement on class educational management in Sichuan higher education institutions. 1) to investigate the current status of teachers' mentoring engagement and class management effectiveness, 2) to analyze the correlation between them, and 3) to explore the impact of mentoring engagement on management outcomes. Research population is undergraduates from a university in Chengdu. Sample is 377 students selected by simple random sampling. Data were collected using the self-developed Sichuan Teaching Faculty Mentoring Engagement Scale (STFMES) and a revised Class Educational Management Effectiveness Scale, and analyzed through descriptive statistics, correlation analysis, and multiple linear regression. Research results are 1) teachers' mentoring engagement is at a moderately high level, with emotional commitment highest and time investment lowest; 2) a significant positive correlation exists between mentoring engagement and class management effectiveness; and 3) emotional commitment most strongly predicts class cohesion and student development support, while time investment most influences behavioral norms. All regression models are statistically significant.

Keywords: emotional commitment, class teacher system, mixed-methods research

Introduction

China's higher education is shifting from scale expansion to connotative development, and the role of teachers is expanding from "instructors" to "educators". The responsibility of after-class mentoring has been strengthened by the "Holistic Education" policy (Cen, 2020; Yuan, 2021). However, as an implicit labor, teachers' after-class mentoring has long not been included in the systematic academic evaluation system, as He (2020) pointed out that "the implicit nature of teachers' after-class educational work leads to its neglect in the existing academic evaluation mechanism that focuses on explicit achievements such as teaching and research" (He, 2020).

First, most studies are based on teachers' self-reports or focus on students' individual academic performance, and few start from the perspective of how students perceive, interpret and integrate teachers' engagement into collective class evaluations (Kelly et al., 2024; Y. Wang, 2024). Kelly et al. (2024) also noted that "existing research on teachers' mentoring

engagement mostly ignores the collective perception of students, failing to reflect the overall impact of teachers' behaviors on the class"*.

Second, existing studies show a point-to-point characteristic: some focus on emotion and cohesion, while others analyze time and discipline. There is a lack of an integrated framework that matches the three-dimensional "Time-Emotion-Cognition" engagement with the four-dimensional class effects of "academic performance-norms-cohesion-development" (Xiao et al., 2022; L. Wang, 2022). As Xiao et al. (2022) indicated, *"the fragmentation of existing research on teachers' mentoring and class effects makes it difficult to reveal the comprehensive mechanism between different dimensions of engagement and diverse class outcomes".

Third, most studies are based on resource-abundant regions or primary and secondary school stages, and there is a lack of empirical research on how teachers in western universities optimize their limited engagement under the constraints of "large class sizes and high student-teacher ratios" (Sun, 2020; Z. Wang & Gao, 2024; Long, 2020). Sun (2020) emphasized that *"the unique resource constraints in western universities bring special challenges to teachers' after-class mentoring, which has not been fully concerned in previous empirical studies".

Research Objectives

1. To study the current status of Teaching Faculty's Mentoring Engagement and Effectiveness of Classroom Educational Management in S University in Sichuan
2. To study the correlation between Teaching Faculty's Mentoring Engagement and Effectiveness of Classroom Educational Management in S University in Sichuan
3. To propose strategies for enhancing the Effectiveness of Classroom Educational Management by optimizing Teaching Faculty's Mentoring Engagement in S University in Sichuan

Conceptual Framework

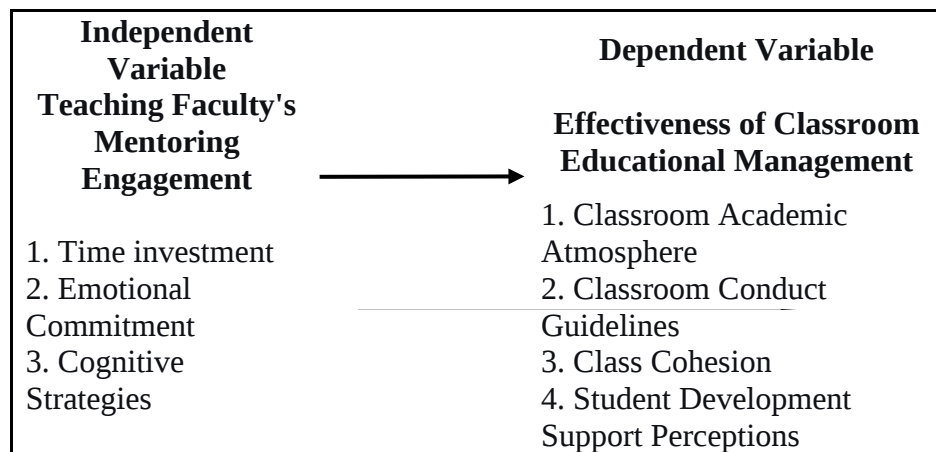


Figure 1 Conceptual Framework Diagram

Literature Review

Core Concepts

Teaching Faculty's Mentoring Engagement: It refers to the total amount of time, emotional, and cognitive resources that university teachers voluntarily invest outside classroom teaching to promote students' all-round development and the construction of class collectives. This concept has evolved from "workload" to "psychological engagement" and then to "comprehensive educational engagement" (Poczwadowski et al., 2003; Schaufeli et al., 2002). As Poczwadowski et al. (2003) noted, early research simplified professional engagement into quantifiable workload, while Schaufeli et al. (2002) expanded it to include positive psychological states, and this study further develops it into a comprehensive educational engagement covering multiple resources. This study operationalizes it into three dimensions:

Time Investment: The consumption of objective time resources for after-class mentoring. It includes both explicit and implicit time such as fixed tutoring, online Q&A, and informal communication, serving as the material foundation for the frequency and sustainability of teacher-student interactions (Zhentian, 2013). As Zhentian (2013) defined, it encompasses all voluntary time that teachers devote to after-class educational activities beyond formal teaching tasks, whether structured or unstructured.

Emotional Commitment: It refers to the value recognition, emotional attachment, and internal sense of responsibility towards educational work. It is manifested in sincere care for students, empathy for students' growth, and attention to class development, acting as the psychological bond that drives teachers' sustained engagement (Yang et al., 2019). Yang et al. (2019) emphasized that emotional commitment is the core intrinsic motivation for teachers to actively participate in after-class mentoring beyond task requirements.

Cognitive Strategies: The planned, reflective, and adaptive psychological processes and methodological systems employed in the mentoring process. It involves needs diagnosis, goal setting, strategy adjustment, effect evaluation, etc., and serves as an "effectiveness converter" connecting intentions and outcomes (Kelly et al., 2024). As Kelly et al. (2024) stated, cognitive strategies embody teachers' professional wisdom in mentoring, enabling them to effectively integrate resources and transform good intentions into practical educational effects.

Effectiveness of Classroom Educational Management: As a grassroots educational unit in universities, it is the comprehensive embodiment of the collective state and development outcomes of a class presented through teacher-student and student-student interactions under the guidance of teachers. This study operationalizes it into four dimensions:

Class Academic Atmosphere: The shared psychological environment within a class regarding learning attitudes, behaviors, and expectations. It reflects members' attention to learning, the activity of academic interactions, and the common interest in knowledge exploration.

Class Behavioral Norms: The level and consistency of collective behaviors among members in abiding by school rules and regulations and maintaining public order. It is a fundamental achievement of class management, reflecting discipline and organization.

Class Cohesion: The attractiveness of the class to its members and the degree of mutual attraction, unity, and cooperation among members. It is manifested in a sense of belonging, identity, mutual assistance, and collective honor.

Support for Students' Individual Development: The perceived support and substantive opportunities provided by the class environment to promote students' individual growth in cognition, emotion, sociality, career planning, and other aspects. It is an important embodiment of realizing "Holistic Education".

Related Theories

The theory of Teaching Faculty's Mentoring Engagement provides a direct conceptual foundation for defining and measuring the core independent variable of this study. Drawing on the core of the three-dimensional model of work engagement proposed by Schaufeli et al. (2002), this study conducts localized reconstruction by combining the practical requirements of "Holistic Education" in Chinese universities and the particularity of teachers' educational roles, and proposes a three-dimensional "Time-Emotion-Cognition" engagement model. As Schaufeli et al. (2002) defined the core of their model, work engagement is a positive psychological state characterized by vigor, dedication, and absorption, and this study further adapts it to the context of Chinese university teachers' educational work. This model emphasizes that high-quality mentoring engagement is the organic unity of time, emotion, and cognition. This framework directly guided the development of the Scale of Teaching Faculty's Mentoring Engagement in Sichuan Universities (STFMES) and provided an analytical basis for exploring the differentiated impacts of different types of engagement combinations on the effectiveness of classroom management.

Social Exchange Theory (Blau, 1964; Cropanzano & Mitchell, 2005) posits that human behavior is based on a trust-based principle of reciprocity. Blau (1964) pointed out that individuals tend to maintain a balance between inputs and outputs in social interactions, and Cropanzano & Mitchell (2005) further expanded this theory to organizational contexts. This theory suggests that supportive school policies and positive class feedback are the key situational factors influencing teachers' willingness to engage and the exertion of their effectiveness.

The triadic reciprocal determinism of Social Cognitive Theory (Bandura, 1986) provides a refined framework for understanding the dynamic interaction among teachers' engagement, classroom environment, and student behavior. As Bandura (1986) proposed, personal factors, behaviors, and environmental factors interact with each other to jointly determine individual development. This framework dynamically connects teachers' individual cognition and behavior, the collective psychological climate of the class, and the effectiveness of classroom educational management, providing a psychological foundation for constructing the influence mechanism model.

Drawing on Bronfenbrenner's (1979) ecological model of human development, the Class Ecosystem Theory emphasizes examining educational phenomena within a multi-level and interrelated environmental system (Yang et al., 2019). Bronfenbrenner (1979) advocated that human development should be studied in the context of nested environmental systems, and Yang et al. (2019) applied this perspective to class research. This theory provides a systematic situational analysis framework for this study.

Research Methodology

"Insert content" Details of population, sample group, sampling method, sample size, variables, data collection, data analysis methods, and interpretation of results.

Population and Sample

The overall population of this study consisted of all full-time undergraduate students at University S in Chengdu, Sichuan Province. A simple random sampling method was adopted to randomly select respondents from the list of full-time undergraduate students at University S, so as to ensure the representativeness and scientificity of the sample.

According to the 2025 data released on the official website of University S, the total number of full-time undergraduate students in the university (N) was 21183. The confidence level was set at 95% (corresponding to $\chi^2=3.841$), the sampling error (d) was 0.05, and the most conservative estimate (p=0.5) was adopted. The calculation results showed that the minimum individual sample size required through simple random sampling was approximately 377.

A total of 390 questionnaires were distributed in this study, and 377 valid questionnaires were recovered, with an effective recovery rate of 96.67%, which met the sample size required by the sampling design.

Research Instrument

Scale of Teaching Faculty's Mentoring Engagement : For the independent variable "Teaching Faculty's Mentoring Engagement", the self-compiled Scale of Teaching Faculty's Mentoring Engagement in Sichuan Universities (STFMES) was adopted. Based on the three-dimensional model of work engagement proposed by Schaufeli et al. (2002) and the context of "Holistic Education" in Chinese universities, this scale constructed a three-dimensional theoretical framework of "Time-Emotion-Cognition", consisting of 30 items with 10 items in each dimension. A 5-point Likert scale was used for scoring (1 = strongly disagree, 5 = strongly agree).

The results of reliability and validity tests showed that: the Cronbach's α coefficient of the total scale was 0.965, and the α coefficients of the three dimensions ranged from 0.914 to 0.937, indicating good internal consistency; exploratory factor analysis (EFA) showed that the three-factor structure was clear, with a cumulative variance explanation rate of 69.44%; confirmatory factor analysis (CFA) showed that the model fit indices were as follows: $\chi^2/df = 1.92$, RMSEA = 0.048, CFI = 0.971, TLI = 0.968, GFI = 0.943, which indicated a good model fit.

Scale of Classroom Educational Management Effectiveness : For the dependent variable "Effectiveness of Classroom Educational Management", the revised Scale of Classroom Educational Management Effectiveness was adopted. Based on Fraser et al.'s (1996) "My Class Inventory" and relevant domestic studies, combined with the characteristics of class management in Chinese universities and the fundamental task of "moral education", this scale formed a four-dimensional structure including Class Academic Atmosphere, Class Behavioral Norms, Class Cohesion, and Support for Students' Individual Development, consisting of 20 items with 5 items in each dimension. A 5-point Likert scale was used for scoring (1 = strongly disagree, 5 = strongly agree).

The results of reliability and validity tests showed that: the Cronbach's α coefficient of the total scale was 0.952, and the α coefficients of the four dimensions ranged from 0.876 to 0.899, indicating good internal consistency; exploratory factor analysis (EFA) showed that the four-factor structure was clear, with a cumulative variance explanation rate of 79.26%; confirmatory factor analysis (CFA) showed that the model fit indices were as follows: $\chi^2/df = 2.08$, RMSEA = 0.052, CFI = 0.969, TLI = 0.965, GFI = 0.938, which indicated a good model fit.

Semi-Structured Interview Outline : To deeply interpret the quantitative results, a self-compiled semi-structured interview outline for students was adopted, consisting of 10 core questions covering three aspects: ① Observations on teachers' after-class mentoring behaviors and perceptions of their impacts on individuals and the class; ② Personal feelings and evaluations of the class academic atmosphere, peer relationships, disciplinary status, and the level of support for personal growth; ③ Identification and opinions on the core factors

affecting the quality of the class. The interview outline was reviewed and revised by 3 experts in the field of educational management to ensure its content validity.

Data Collection

Questionnaire Survey: Data collection was completed in the autumn semester of 2025. Through the university's official email system and curriculum learning platform, standardized invitation letters were sent to 390 randomly selected students, including a research description, informed consent form, and questionnaire link. The questionnaire was designed and released using a professional online survey platform, with functions of preventing duplicate submissions and logical jumps to ensure data anonymity. A gentle reminder was sent one week after the distribution. Finally, 377 valid questionnaires were recovered, with an effective recovery rate of 96.67%.

In-depth Interviews: After the questionnaire survey, 15 representative students were selected using purposive sampling. The sampling criteria took into account differences in class types, differences in class effectiveness evaluations, and differences in demographic backgrounds. Before the interview, an informed consent form was provided to the interviewees, clearly informing them of the research purpose, recording matters, data usage, and confidentiality principles. The interview began only after obtaining written consent. Each interview lasted 40-70 minutes, was conducted in a quiet and private place, and was recorded in full. After the interview, the recordings were transcribed verbatim into texts, with all personally identifiable information removed, resulting in a total of approximately 150,000 words of transcribed texts.

Data Analysis

Quantitative Data Analysis Methods : This study adopted SPSS 26.0 and AMOS 26.0 for quantitative data analysis. Through descriptive statistical analysis, reliability and validity tests, correlation analysis, and multiple linear regression analysis, the relationship between Teaching Faculty's Mentoring Engagement and Effectiveness of Classroom Educational Management was systematically tested, and the three research objectives and 13 research hypotheses were responded to one by one.

Descriptive Statistical Analysis: Frequency, percentage, mean, and standard deviation were used to describe the demographic characteristics of the sample, as well as the current level, distribution characteristics, and internal structure of core variables, so as to respond to Research Objective 1.

Reliability and Validity Tests: Cronbach's α coefficient was used to test the internal consistency reliability of the scales; exploratory factor analysis (EFA) was adopted to explore the factor structure of the scales; confirmatory factor analysis (CFA) was used to test the goodness of fit of the measurement model (χ^2/df , RMSEA, CFI, TLI, GFI), so as to ensure the reliability and validity of the research tools.

Correlation Analysis: Pearson product-moment correlation analysis was used to test the correlation strength and direction between the three dimensions of Teaching Faculty's Mentoring Engagement and the four dimensions of Effectiveness of Classroom Educational Management, providing preliminary evidence for Hypothesis H1.

Regression Analysis: Multiple linear regression analysis was adopted to test the independent net effects of each dimension of Teaching Faculty's Mentoring Engagement on the overall and each dimension of Effectiveness of Classroom Educational Management under the condition of controlling demographic variables, so as to verify 12 sub-hypotheses (H1a-

H3d) one by one. Collinearity diagnosis was judged by Variance Inflation Factor (VIF), and the VIF values of all models were lower than the critical value of 10, indicating no serious collinearity problem.

Common Method Bias Test: Harman's single-factor test was used. The results of unrotated exploratory factor analysis showed that the variance explained by the first factor was 28.63%, which was lower than the critical value of 40%, indicating that there was no serious common method bias.

The significance level was uniformly set at $\alpha=0.05$.

Qualitative Data Analysis Methods : This study adopted Nvivo 12 Plus to conduct three-level coding analysis on the 15 interview transcribed texts: first, open coding was performed to identify meaningful content units from the original texts and form initial concepts; then, axial coding was carried out to classify and integrate the open codes, establishing the relationships between categories and subcategories; finally, selective coding was implemented to extract core themes and construct an integrated interpretive framework.

To ensure the reliability and validity of the research, the following strategies were comprehensively adopted: ① Triangulation method, which cross-validated the qualitative findings with the quantitative results; ② Member checking method, which fed back the preliminary analysis results to some interviewees to confirm the accuracy of the interpretations; ③ Peer review method, which invited two postgraduates majoring in educational management to conduct independent coding and compare the consistency of their coding results.

Achievement of Research Hypotheses and Objectives : Through the systematic application of the above quantitative and qualitative data analysis methods, all three research objectives of this study have been completed, and all 13 research hypotheses have been supported.

Research Objective 1: Through descriptive statistical analysis, the current situation structure of teachers' mentoring engagement characterized by "high emotion, low time" and the effectiveness of classroom educational management characterized by "norms being superior to development" has been revealed.

Research Objective 2: Through Pearson correlation analysis, it has been confirmed that there is a highly significant positive correlation between teachers' mentoring engagement and the effectiveness of classroom educational management ($r=0.792$, $p<.01$), and the overall Hypothesis H1 is established.

Research Objective 3: Through multiple linear regression analysis, 12 sub-hypotheses (H1a-H3d) regarding the effects of time investment, emotional commitment, and cognitive strategies on academic atmosphere, behavioral norms, cohesion, and support for students' individual development have been tested and confirmed to be supported one by one; qualitative thematic analysis has further revealed four mechanisms of action: "emotional adhesive", "time visibility", "cognitive professionalism", and "difference in role expectations", providing contextualized explanations for the quantitative results.

The mutual confirmation of quantitative and qualitative data indicates that the measurement tools of this study are reliable, the analysis strategies are effective, and the research conclusions are robust, laying a solid empirical foundation for the proposal of subsequent management suggestions.

Research Results and Discussion

Objective 1: The study found that the overall level of Teaching Faculty's Mentoring Engagement was above average, but presented a "high emotion, low time" structure: Emotional

Commitment achieved the highest score ($M=3.78$), while Time Investment obtained the lowest score ($M=3.35$). Correspondingly, the Effectiveness of Classroom Educational Management also showed a pattern of "norms being superior to development": Class Behavioral Norms scored the highest ($M=3.68$), whereas Support for Students' Individual Development scored the lowest ($M=3.45$).

Table 1: Descriptive Statistics of Core Variables

Variable	Dimension	Mean	SD	Rank
Teacher Mentoring Engagement	Affective Commitment	3.78	0.73	1
	Cognitive Strategy	3.58	0.77	2
	Time Investment	3.35	0.8	3
	Behavioral Norms	3.68	0.7	1
Class Educational Management Effectiveness	Cohesion	3.61	0.75	2
	Academic Atmosphere	3.52	0.73	3
	Student Development	3.45	0.78	4
	Support			

The research findings of Objective 1 reflect the deep tension between teachers' ideal role and realistic constraints. The high level of Emotional Commitment is a positive manifestation of teachers' professional spirit and the advocacy of the "moral education" policy (Cen, 2020; Yuan, 2021). However, the relative lack of Time Investment exposes the dilemma that after-class mentoring, as implicit labor, is systematically underestimated under the dual pressure of the scientific research evaluation system and teaching tasks (Zhang, 2020; Y. Wang, 2024). As Zhang (2020) indicated, "the current academic evaluation system overemphasizes explicit achievements such as scientific research papers and class hours, resulting in the neglect of teachers' implicit efforts in after-class mentoring". In addition, the pattern of "norms being superior to development" suggests that class management has not yet completely broken away from the bottom-line logic of order maintenance, and the systematic insufficiency in supporting personalized development is in contrast to the developmental orientation of "Holistic Education" (He, 2020).

Objective 2: The study found that there was a highly significant positive correlation between Teaching Faculty's Mentoring Engagement and Effectiveness of Classroom Educational Management (overall $r=0.792$, $p<.01$), with a clear dimensional correlation pattern: Emotional Commitment had the strongest correlations with Class Cohesion ($r=0.804$) and Support for Students' Individual Development ($r=0.818$); Time Investment had the strongest correlation with Class Behavioral Norms ($r=0.721$).

Table 2: Correlation Matrix of Teacher Mentoring Engagement and Class Effectiveness Dimensions (r)

Engagement Dimension	Academic Atmosphere	Behavioral Norms	Cohesion	Student Development Support
Time Investment	0.672	0.721	0.648	0.625
Affective Commitment	0.781	0.735	0.804	0.818
Cognitive Strategy	0.716	0.684	0.746	0.762

Note: All correlations significant at $p < .01$

The research findings of Objective 2 provide empirical support for the Class Ecosystem Theory (Bronfenbrenner, 1979). As Bronfenbrenner (1979) proposed in his ecological model of human development, the microsystem is the most immediate environment affecting individual growth, and teachers' behaviors, as key active factors within this microsystem, are closely intertwined with class collective efficacy. The extremely strong correlations between Emotional Commitment, Class Cohesion, and Support for Students' Individual Development echo the core assertion of positive psychology: college students still have a strong demand for deep emotional connections, and positive teacher-student and peer relationships are the soil for nurturing collective unity (Wentzel, 1997). Wentzel (1997) also emphasized that positive interpersonal relationships in educational contexts play a crucial role in promoting students' social adaptation and collective identity. In contrast, the strong correlation between Time Investment and Class Behavioral Norms explains the basic conditions for norm formation from the perspective of resource constraints—stable and visible teacher-student interaction is the physical premise for the internalization of rules and the cultivation of good habits (Zhentian, 2013), which is consistent with Zhentian's (2013) definition of Time Investment as the material foundation for teacher-student interaction.

Objective 3: The study found that the three-dimensional engagement (Time Investment, Emotional Commitment, and Cognitive Strategies) jointly explained 64.7% of the variance in class effects, with Emotional Commitment having the strongest independent net effect ($\beta=0.396$). Moreover, the division of labor in the influence paths was clear: Time Investment had the most prominent predictive effect on Class Behavioral Norms ($\beta=0.278$) and served as the basic resource for order maintenance; Emotional Commitment had the strongest predictive power on Class Cohesion ($\beta=0.352$) and Support for Students' Individual Development ($\beta=0.336$) and was the core of relational capital; Cognitive Strategies made significant contributions to Support for Students' Individual Development ($\beta=0.298$) and Class Cohesion ($\beta=0.256$) and acted as the effectiveness amplifier for transforming engagement into outcomes. Qualitative interviews summarized four mechanisms: emotion serves as the "adhesive", the "visibility" of time promotes the internalization of norms, the "professionalism" of cognition enhances the sense of gain, and the difference in role expectations between head teachers and non-head teachers moderates the effect of engagement.

Table 3: Standardized Regression Coefficients (β) of Three-Dimensional Engagement on Four-Dimensional Effectiveness

Dependent Variable	Time Investment	Affective Commitment	Cognitive Strategy	Adjusted R ²
Behavioral Norms	0.278	0.262	0.186	0.431
Cohesion	0.185	0.352	0.256	0.472
Student Development	0.204	0.336	0.298	0.496
Support Academic Atmosphere	0.198	0.305	0.227	0.418

Note: all coefficients significant at $p < .05$

The research findings of Objective 3 reveal the social construction logic of how teachers' engagement affects class effectiveness. From the perspective of Social Cognitive Theory, Emotional Commitment improves class collective efficacy through observational learning and emotional infection, transforming emotional capital into unity and mutual trust (Bandura, 1986; L. Wang, 2022). Bandura (1986) emphasized that collective efficacy is shaped by the behaviors and emotional expressions of key figures in the group, which is consistent with the strong predictive effect of teachers' Emotional Commitment found in this study. From the perspective of Social Exchange Theory, Time Investment establishes an implicit contract through "presence demonstration"—teachers' continuous engagement in after-class mentoring in exchange for students' conscious compliance with norms, forming a reciprocal cycle (Cropanzano & Mitchell, 2005). Cropanzano & Mitchell (2005) also noted that reciprocal relationships in organizational contexts can effectively promote individuals' willingness to invest continuously. Most importantly, the difference in role expectations, as a situational moderating mechanism, confirms the Class Ecosystem Theory: the same engagement will produce differentiated effects after being filtered through the "interpretive framework" of different role identities (Yang et al., 2019). Teachers' engagement is not directly injected into the class; instead, it is ultimately precipitated into a shared class cognitive and behavioral model through students' perception screening, meaning interpretation, and peer interaction.

Research Suggestions

This study provides preliminary evidence for understanding the relationship between teachers' mentoring engagement and the effectiveness of classroom educational management in western universities. However, limited by the research cycle, sample scope, and methodological design, there is room for expansion. Future research can be deepened in the following four aspects.

Deepening Research Design: This study adopts a cross-sectional questionnaire survey, which can reveal the covariant relationship between variables but is difficult to establish a strict causal sequence and cannot reflect the dynamic evolution of the two along the educational cycle (Perera et al., 2021). As Perera et al. (2021) emphasized, "cross-sectional studies can only show the correlation between variables at a specific time point, while longitudinal designs are necessary to clarify the causal relationship and dynamic changes over time" (Perera et al., 2021). Future research should introduce a longitudinal follow-up design, conduct multiple rounds of data collection within one academic year, use a cross-lagged model to test the

bidirectional predictive relationship between teachers' engagement and class effects, and observe whether teachers' engagement strategies are dynamically adjusted with the class development stage. At the same time, quasi-experimental intervention research can be developed: design teacher development workshops around key dimensions such as emotional response and cognitive strategies, and test the net effect of specific training on teachers' engagement behaviors and class outcomes through randomized controlled trials, so as to provide replicable empirical schemes for teacher development centers.

Expanding Mechanism Exploration: This study depicts the differentiated predictive paths of three-dimensional engagement on four-dimensional effects through regression analysis, but the core question of "through what psychological and social processes teachers' engagement is transformed into class effectiveness" still needs to open a more refined black box. Future research should systematically test the mediating mechanisms: based on Social Cognitive Theory, introduce variables such as class collective efficacy, teacher-student relationship quality, and students' sense of belonging, and use structural equation modeling to quantify their effect proportion in the influence path. At the same time, attention should be paid to the contextual complexity of the moderating mechanisms: at the school level, examine how evaluation systems and resource support intensity moderate teachers' willingness to engage and their effectiveness; at the class level, test the contingent effects of variables such as class size, student source characteristics, and head teacher allocation; at the macro trend level, explore how educational digitalization (such as blended teaching and online Q&A) redefines the operational connotation of "time investment" and "cognitive strategies".

Enriching Research Methods and Contexts: This study focuses on a typical local undergraduate university in Sichuan Province. Although the conclusions have reference value for similar western universities, their generalizability still needs cross-context verification. Future research should expand sample diversity: cover universities of different school-running levels (Double First-Class, ordinary undergraduate, vocational colleges), different regions (eastern, central, and western China), and different management models (homeroom teacher system, tutor system, full-time counselor system), and test whether the mechanism of teachers' engagement varies with institutional culture, resource endowment, and institutional arrangements through cross-context comparison. In terms of methods, social network analysis can be introduced: through the density and centrality indicators of class help-seeking networks and friendship networks, supplement the shortcomings of "attribute data" analysis from the perspective of "relational data"; diachronic case studies can also be adopted to conduct long-term in-depth research on typical classes, depicting the micro-interaction details of the formation of teachers' engagement strategies and the generation of class atmosphere.

Improving the Analysis Level: Educational management research is essentially oriented to a multi-level nested system: individual students are nested in classes, classes in departments, and departments in universities. Although it is reasonable for this study to aggregate individual student data to the class level for analysis, it fails to completely separate the effects of individual and organizational levels. Future research should collect large-scale, multi-level samples (multiple universities, dozens of departments, hundreds of classes), and use hierarchical linear modeling or hierarchical structural equation modeling (HLM/MSEM) to handle individual-level, class-level, and department-level variables simultaneously. This method can accurately estimate the net class-level effect of teachers' engagement, test the cross-level moderating effect of departmental factors on the relationship between class-level variables, and clearly reveal the source composition of differences in the effectiveness of classroom educational management. Researchers with conditions can also explore cooperation

with university data centers, and on the premise of complying with ethical norms, use learning management system logs, campus card behavior data, etc., as supplementary objective continuous measurements of teachers' time investment and students' academic participation, forming triangulation with scale data.

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