

# *The Effect of College Teachers' Innovative Classroom Teaching Behavior on Learning Engagement: the Mediating Effect of Teaching*

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**Abstract:** To explore the mediating role of teaching satisfaction between college teachers' innovative teaching behaviour and learning engagement. Using the Teachers' Innovative Classroom Teaching Behavior Scale, Learning Engagement Scale and Teaching Satisfaction Scale, a network questionnaire survey was conducted among 401 college students, and the Bootstrap method was used to test and analyze the mediating effect with Process 3.4 software. There is a positive correlation between teachers' innovative classroom teaching behavior, learning engagement and teaching satisfaction scale ( $r$  is: 0.586, 0.842, 0.607,  $P < 0.001$ ); teaching satisfaction plays a mediating role between the two. College students' teaching satisfaction can play a partial mediating role in teachers' innovative teaching behavior and learning engagement, which increases students' learning engagement by improving teachers' innovative teaching satisfaction.

## 1. Introduction

Innovative talents have also become a hot topic of social concern. With the progress of science and technology, the changes of the times, the society imposes increasingly stricter requirements for the quality of talents, bringing a growing demand for innovative talents. Colleges and universities are a place to transfer talents to the society, so it is the first choice and core goal to cultivate innovative professional talents in higher education development. As an important part in college education, college teachers are the key to cultivating creative talents. Dewi (2017) et al. pointed out that in order to cultivate students with innovative ability, teachers should first possess innovative ability [1]. The cultivation of college students' creativity has close relation to teachers. Unqualified teachers will hinder students' creative development [2]. The creative teaching behavior of college teachers is an important way and means to cultivate college students' creativity [3]. Innovative teaching behavior can enhance students' participation [4]. First, Misseyanni (2018) believes that innovative teaching should give play to students' initiative in learning [5], that is to say, to construct student-driven teaching [6]. Students with greater initiative will be more engaged in learning [7, 8],

while learning engagement is an important evaluation index for testing teachers' teaching effectiveness. Engaging in learning requires whole-hearted learning, communication and cooperation to solve problems, and results contributing to social needs, whose goal is to promote students' effective learning. Studies have found that teaching skills and methods in teaching behavior [9, 10] exert a significant impact on learning engagement. For example, flipped learning teaching method can effectively create students' learning engagement and satisfaction [11], while boring and single teaching methods reduce students' learning engagement [12]. Therefore, teachers' different teaching methods and skills affect students' learning engagement. Second, Fisher (2021) et al. found that learning satisfaction exerts a positive impact on learning engagement [11], then proposed that higher teachers' teaching proficiency can help improve student satisfaction, and innovative teaching behaviors also promote learning satisfaction [2, 13]. In recent years, there have been a lot of researches involving teaching innovation and students in academia, and more of them are based on three aspects: different disciplines, innovation ability and measurement of teachers' teaching innovation. Students are the main body of learning, and the effectiveness of students' learning is the most convincing proof for teachers' teaching proficiency.

Proceeding from the relationship among the three variables of teachers' innovative teaching behavior, learning engagement, and teaching satisfaction, this research investigates college students to explore the key factors in improving students' learning engagement. Data shows that evaluation of teachers' teaching by college students at this stage is correlated with the level of learning engagement and teaching satisfaction. Research on the relationship between the three helps teachers better perceive the impact of their teaching innovation on students, so that they better improve teaching ability.

## 2. Objects and Methods

### 2.1. Subjects

After distribution of questionnaire to college students from three colleges, a total of 434 questionnaires were collected by random sampling, and 401 valid questionnaires remained after deleting 33 unqualified ones. There were 218 boys (52%) in the survey, aged 19-23 years, with an average age of  $(20.71 \pm 0.85)$  years.

### 2.2. Research Tools

Teachers' Innovative Teaching Behavior Scale: Fang Xuanting's (2021) scale for the evaluation of college students' creative classroom behavior was adopted. The scale includes five dimensions: emotional maintenance, innovation encouragement, critical thinking, feedback evaluation and open thinking, involving 15 questions. A self-assessment 5-point scale was adopted, with 1 representing "completely non-conforming" and 5 representing "completely conforming". Cronbach's  $\alpha$  coefficient is 0.915.

Learning Engagement Scale: Learning Engagement Scale prepared by Schaufeli (2002) et al. and modified in 2008 by Fang Laitan, Shi Kan and Zhang Fenghua (2008) was adopted, which has 3 dimensions, including vitality, dedication and focus. The scale has a total of 16 items. A self-assessment 7-point scale was adopted, with 1 for "never" and 7 for "always, almost every day". Its Cronbach  $\alpha$  coefficient is 0.874.

Teaching Satisfaction Scale: The scale prepared by Wang Yunwu and Yang Man was adopted with reference to domestic and foreign teaching satisfaction scales. The scale has 4 dimensions, namely teaching attitude, teaching content, teaching method and teaching effect, etc., with a total of 21 items. A self-assessment 5-point scale was adopted, with 1 representing "very dissatisfied" and 5

representing "very satisfied". Cronbach's  $\alpha$  coefficient is above 0.853.

### 2.3. Statistical Analysis

SPSS 22.0 was used for data analysis, and Pearson correlation coefficient was used for correlation analysis. The mediating effect adopts Process3.4 model IV.

## 3. Results

### 3.1. Variable Correlation Analysis

In order to study whether there is a significant correlation between innovative teaching behavior, learning engagement and teaching satisfaction, this study adopts spss23.0 Pearson correlation analysis method for testing.

Table 1: Correlation analysis on innovative teaching behavior, learning engagement and teaching satisfaction

	Effect size ( $\beta$ )	Boot standard deviation	Boot lower limit	Boot upper limit	Relative value
Total effect	0.969	0.214	0.311	1.134	
Direct effect	0.394	0.185	0.040	0.772	40.66%
Indirect effect	0.575	0.164	0.243	0.882	59.34%

The correlation analysis results of innovative teaching behavior, learning engagement and teaching satisfaction are illustrated in Table 1: the correlation coefficient between teaching satisfaction and learning engagement is 0.607, that is,  $r=0.607$ , and the corresponding significance level is 0.000, which is less than 0.01, indicating a moderate correlation between teaching satisfaction and learning engagement. The correlation coefficient between innovative teaching behavior and learning input is 0.586, that is,  $r=0.586$ , and the corresponding significance level is 0.000, which is less than 0.01, indicating a moderate correlation between innovative teaching behavior and learning input. The correlation coefficient between innovative teaching behavior and teaching satisfaction is 0.842, that is,  $r=0.842$ , and the corresponding significance level is 0.000, which is less than 0.01, indicating a strong correlation between teaching satisfaction and learning engagement.

### 3.2. Analysis of Mediating Effect

The above results prove a certain correlation between innovative teaching behavior, learning engagement and teaching satisfaction, so the next step of statistical analysis can be performed. Using the Proce 3.4 plug-in model IV in SPSS, a sample size of 5000 and a 95% confidence interval were set to analyze the mediating role of teaching satisfaction between innovative teaching behavior and learning engagement. According to the results in Table 2, after controlling demographic variables such as gender, grade, discipline and major category and performance level, in the model with innovative teaching behavior as the independent variable and learning engagement as the dependent variable, the standardized coefficient B of innovative teaching behavior on learning engagement is 0.969 ( $t=11.795$ ,  $p<0.001$ ), indicating that after excluding the interference of demographic variables, innovative teaching behavior exerts a significant positive impact on learning engagement. When teaching satisfaction is added as a mediating variable, the standardized coefficient B of innovative teaching behaviors on learning engagement is 0.394, ( $t=2.84$ ,  $p<0.01$ ), indicating that innovative teaching behavior has a significant effect on learning

engagement after excluding the interference from demographic variables, so H1 is verified. Secondly, in the model with innovative teaching behavior as the independent variable and teaching satisfaction as the dependent variable, after controlling demographic variables, the standardized coefficient B of innovative teaching behavior on teaching satisfaction is 0.838 ( $t=28.257$ ,  $p<0.001$ ), indicating that after excluding the interference from demographic variables, innovative teaching behavior exerts a significant positive impact on teaching satisfaction.

Table 2: Mediating Model Tests with Controlled Demographic Variables

Regression equation (N=401)		Fitting index			Coefficient significance		
Outcome variable	Predictor variable	R	R <sup>2</sup>	F	B	t	
Learning engagement		0.65	0.42	48.129**			
		0	3	*			
		Gender				-0.180	-2.042*
		Grade				0.022	0.502
		Discipline and major category				0.015	0.232
		Home address				-0.141	-1.595
		Performance level				-0.350	-6.262***
		Innovative teaching behavior				0.969	11.795***
Teaching Satisfaction		0.85	0.72	171.281			
		0	3	***			
		Gender				-0.003	-0.090
		Grade				-0.054	-3.430***
		Discipline and major category				-0.007	-0.287
		Home address				0.035	1.104
		Performance level				-0.048	-2.360*
		Innovative teaching behavior				0.838	28.258***
Learning engagement		0.67	0.45	47.514**			
		7	8	*			
		Gender				-0.178	-2.082*
		Grade				0.059	1.374
		Discipline and major category				0.019	0.313
		Home address				-0.165	-1.923
		Performance level				-0.317	-5.812***
		Innovative teaching behavior				0.394	2.840**
	Gender				0.686	5.071***	

Thirdly, after adding teaching satisfaction as a mediating variable, the standardized coefficient B of teaching satisfaction on learning engagement is 0.686 ( $t=5.071$ ,  $p<0.01$ ), indicating that teaching satisfaction exerts a significant positive effect on learning engagement, so H3 is verified.

Table 3: Decomposition table of total effect, direct effect and mediating effect

	Effect size ( $\beta$ )	Boot standard deviation	Boot lower limit	Boot upper limit	Relative value
Total effect	0.969	0.214	0.311	1.134	
Direct effect	0.394	0.185	0.040	0.772	40.66%
Indirect effect	0.575	0.164	0.243	0.882	59.34%

Finally, Table 3 reveals that the direct effect of innovative teaching behavior on learning engagement has a confidence interval of 0.040~0.772 (95%CI), excluding 0, indicating that innovative teaching behavior exerts significant direct effect on learning engagement. In the indirect effect with teaching satisfaction as the mediating effect, its confidence interval is 0.243~0.882 (95% CI), excluding 0, indicating significant effect of mediating variable. It can be concluded that teaching satisfaction plays a partial mediating role between innovative teaching behavior and learning engagement.

#### 4. Discussion

This study investigates the relationship between innovative teaching behavior and learning engagement. It was found that there is a positive significant relationship between innovative teaching behavior and learning engagement, innovative teaching behavior can positively predict learning engagement, that is, the more innovative the teaching behavior patterns of college teachers, the higher the students' learning engagement. Students are the main body of the classroom, and teaching innovation will directly affect students' learning input. Liu Xiaoming (2016) found that teaching innovation can help improve students' learning engagement, which is consistent with the findings of this study. Theoretically, college teachers with greater innovative teaching awareness and innovative teaching ability are more likely to innovate the teaching process in teaching implementation. Innovative teaching can let students feel more innovative teaching environment and teaching atmosphere, which contributes to students' knowledge absorption. The innovation theory believes that creation means creativity, and new means new, updated, and changed. Breaking the traditional teaching model has always been valued by the state. Education reform, teaching innovation, and teacher innovation training invariably reflect the government's encouragement and support for educational innovation. In recent years, the state has vigorously supported education and teaching innovation in colleges and universities, hoping that teachers and students can establish an innovative spirit and develop innovation awareness. The author believes that innovation can give people a sense of novelty, newness and freshness. By teaching innovation, it is possible to avoid the disadvantages of traditional teaching, attract students to the classroom, and use new teaching methods to make students concentrate on listening. The research results are consistent with the policies advocated by the state: innovative teaching behavior has a promoting, positive effect on students' learning input, which helps students learn and develop better.

After confirming the positive significant effect of innovative teaching behavior on learning engagement, this study adds the mediating variable of teaching satisfaction to prove the internal mechanism by which innovative teaching behavior affects learning engagement. After controlling demographic variables such as gender, grade, discipline and major category, home address, and performance level, innovative teaching behavior has a significant effect on learning engagement, and teaching satisfaction has a significant impact on innovative teaching behavior and learning engagement. That is to say, research shows that teaching satisfaction plays a partial mediating role between innovative teaching behavior and learning engagement, and innovative teaching behavior affects teaching satisfaction and then learning engagement. The more innovative the teachers' teaching behaviors, the higher the students' teaching satisfaction, and the higher the learning

engagement, which is consistent with the research conclusions of previous scholars. Teaching satisfaction is a subjective evaluation made by students on the school teaching results. As a psychological state in the learning process, teaching satisfaction makes students produce different psychological reflections on the lectures to a certain extent, so that students conduct self-control learning or resist lectures. Students satisfied with the school's teaching are more likely to fully engage in their studies. The research results show that: innovative teaching behavior affects teaching satisfaction and then further affects students' learning engagement, which further highlights the importance and necessity of teaching innovation. At the same time, it can be concluded that students' satisfaction affects their learning engagement. By examining the relevant factors affecting student satisfaction, we can reduce the impact of relevant factors on student satisfaction, thereby helping increase students' learning engagement.

## 5. Conclusion

The results of this study show that college students' teaching satisfaction can play a partial mediating role between teachers' innovative teaching behavior and learning engagement. Hence, by improving teachers' innovative teaching quality, it is possible to increase students' learning satisfaction, and then enhance students' learning engagement.

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