



# Research on Collaborative Education Mechanism Between College Counselors and Full-Time Teachers

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**Abstract.** This paper studies the mechanism of collaborative education between engineers and teachers by constructing a mathematical model. In this paper, confirmatory factor analysis is used to test the convergence validity of the internal items of each variable, the main purpose is to verify the fit between the actual measurement data and the theoretical framework. Overall model fitting index. When using a confirmatory factor analysis validity test, it is necessary to evaluate the fitting of the model and modify the measurement model to improve the fitting degree of the model. This study effectively promotes the adhesion between the counselor team and the full-time teacher team, including enterprise teachers, and forms a common education model.

**Keywords:** Mathematical modeling, Control variable method, Reliability analysis, Statistical modeling, Pedagogy

## 1 Introduction

The mechanism, the structural relationship between the elements, and the mode of operation. The structure, function, and interrelationships of organisms; The structure and working principle of the machine [1].

Difficulties of this study: In the field engineer scenario, the teaching mode needs to be upgraded, the work of counselors needs to be upgraded again, and the existing working mode of counselors needs to be broken. Under the current high-intensity work, counselors and teachers need to spend more time updating their ideas and perspectives and mastering the training needs and standards of field engineers [2]. In ideological and political education, innovation ability training, corporate culture, and other aspects need to pay more [3].

The main research content of this paper:

(1) Through the research of the project, the adhesion between the counselor team and the full-time teacher team, including the enterprise teachers, is effectively promoted to form a common education model, with a high degree of consistency in educational concepts and effective unity of actions [4].

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(2) Include the counselors in the management committee jointly built by the school and the enterprise, and the teaching steering committee jointly built by the school and the enterprise, and jointly participate in the whole process of training field engineers. Establish a good school-enterprise cooperative education mechanism, and form a typical case.

(1) The two teams live together and grow together to promote the construction of the three-in-one education model.

The counselor team and the full-time teacher team need to jointly study the relevant theories of field engineers and deeply understand the importance and necessity of collaborative education [5]. Under the background of field engineers, higher requirements are put forward for the quality of talent training, which requires the participation of both schools and enterprises. This requires enterprise teachers to be included in the full-time teacher management team of the school. Because the two sides have opened up personnel sharing and exchange, it is conducive to the teaching and implementation of professional core courses. However, it also exposes some shortcomings, such as the fact that enterprise teachers need a certain amount of time to adapt to the teaching operation of the school, the integration of enterprise teachers and professional teachers in the school, and the cooperation between enterprise teachers and school counselors [6]. This requires us to strengthen research, strengthen exploration in the education model, continue to promote the integration of schools and enterprises, constantly promote the cohesion of teachers and counselors, promote the team to grow together, unify the concept, innovate the education model, and promote the quality of education [7].

(2) The two sides of the same frequency resonance, strengthen the construction of collaborative education mechanism. Explore and innovate the school-enterprise collaborative education mechanism and implement the operation and management mode of the "Management Committee + teaching Steering Committee". The two sides of the school and enterprise from the aspects of talent training program formulation [8], theoretical teaching, practical training arrangements, practice inside and outside the school, student service and management, etc., to solve the problem of the concept of collaborative education is not strong, the division of responsibilities is not clear, the mechanism is not perfect, the lack of incentive system and so on [9]. The inclusion of student management cadres and some counselors in the management committee, the determination of the scope of responsibilities, and the establishment of the mechanism are conducive to the effective work of counselors and improve the pertinency of work. In the process of participating in talent training, counselors can also effectively integrate into enterprises and enterprise teachers to strengthen management and student services. It is of great significance to improve the quality and work innovation of counselors.

## 2 Validation Factor

Using confirmatory factor analysis to test the convergence validity of the internal items of each variable, the main purpose is to verify the fit between the actual measurement

data and the theoretical framework. According to the suggestion of Huang Fangming [10], the validity test of the scale includes the following conditions:

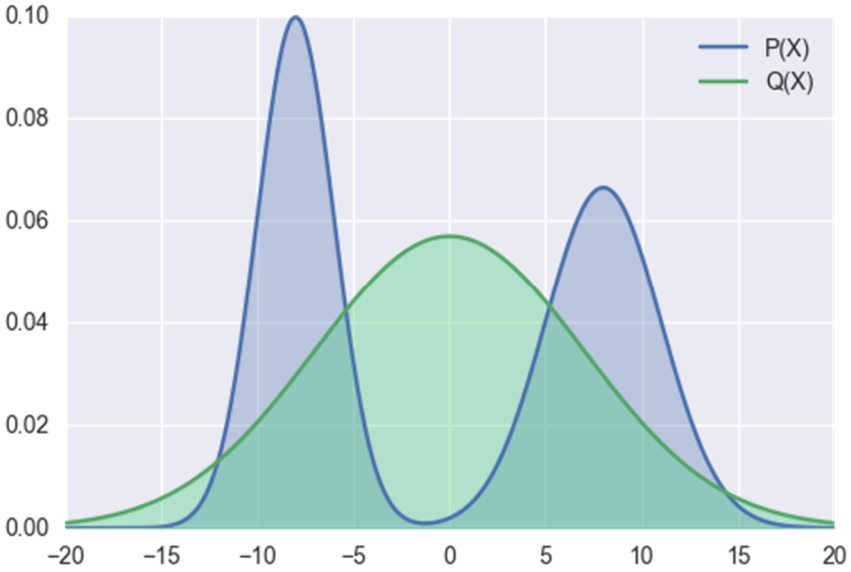
(1) A measurement model is said to have convergent validity if it meets the following conditions: Hair, Anderson, Tatham, Black (2009) and Fornell and Larcker, 1981. Factor loadings are used to assess whether each load is statistically significant and must be greater than 0.7. 2. composite reliability (CR) represents the internal consistency of dimension questions. The higher the reliability, the higher the consistency of these questions, which should be greater than 0.7; 3. Average Variance Extracted (AVE) calculates the variance interpretation ability of each measurement item towards the latent variable [11]. If the AVE value is larger, it indicates that the item has higher reliability and convergence validity.

(2) Overall fitting index of the model. When using a confirmatory factor analysis validity test (**Figure 1**), it is necessary to evaluate the fit of the model and modify the measurement model to improve the fit of the model. According to the suggestion of Hu and Bebtler (1998), The model fitting parameters were mainly selected such as  $X^2/df$ , GFI, AGFI, NFI, IFI, TLI, IFI, CFI, and RMSEA (**Table 1**).

**Table 1.** Cronbach reliability analysis.

Variable	Name	Total correlation of correction items (CITC)	The term has been deleted for Cronbach $\alpha$ coefficient	Cronbach $\alpha$ coefficient
Based on the learning digital platform	UL1	0.701	0.864	0.884
	UL2	0.755	0.852	
	UL3	0.674	0.870	
	UL4	0.692	0.866	
	UL5	0.790	0.843	
Based on social digital platform	US1	0.777	0.801	0.865
	US2	0.713	0.829	
	US3	0.684	0.840	
	US4	0.690	0.839	
Learning engagement	LE1	0.782	0.902	0.917
	LE2	0.716	0.908	
	LE3	0.680	0.909	
	LE4	0.665	0.910	
	LE5	0.667	0.910	
	LE6	0.761	0.904	
	LE7	0.703	0.908	
	LE8	0.716	0.907	
	LE9	0.692	0.908	
Learning burnout	LB1	0.775	0.865	0.895
	LB2	0.700	0.881	
	LB3	0.800	0.860	
	LB4	0.703	0.881	
	LB5	0.745	0.873	
Innovation performance	IP1	0.735	0.722	0.831
	IP2	0.662	0.795	

	IP3	0.676	0.781	
Routine performance	RP1	0.607	0.760	
	RP2	0.661	0.703	0.798
	RP3	0.658	0.706	



P(X): Based on the learning digital platform  
Q(X): Based on social digital platform

Fig. 1. Cronbach reliability analysis

### 3 Experimental Result

It can be seen from the following table that CMIN/DF is 1.357, GFI, AGFI, NFI, TLI, IFI, and CFI all reach the standard above 0.9, and RMSEA is 0.028 and less than 0.08. Most fitting indexes are in line with the standard of general SEM research, so it can be considered that this model is a good fit.

It can be seen from the following table that the standardized factor load of each question is greater than 0.5, the residual is positive and significant, and it is obvious that there is no violation estimate. The combined reliability CR value is greater than 0.7, the average variation extraction AVE is greater than 0.5, reaching the standard of convergence validity, and the compatibility is also in an acceptable range. Therefore, all questions are retained for subsequent analysis (Table 2).

**Table 2.** Fit degree of confirmatory factor analysis model

Fitting index	Acceptable range	Measured value
CMIN		491.352
DF		362
CMIN/DF	<5	1.357
GFI	>0.9	0.933
AGFI	>0.9	0.919
RMSEA	<0.08	0.028
IFI	>0.9	0.982
NFI	>0.9	0.936
TLI(NNFI)	>0.9	0.980
CFI	>0.9	0.982
SRMR	<0.05	0.029

## 4 Conclusion

This paper studies the mechanism of collaborative education between engineers and teachers by constructing a mathematical model. In this paper, confirmatory factor analysis is used to test the convergence validity of the internal items of each variable, the main purpose is to verify the fit between the actual measurement data and the theoretical framework. Overall model fitting index. When using a confirmatory factor analysis validity test, it is necessary to evaluate the fitting of the model and modify the measurement model to improve the fitting degree of the model. This study effectively promotes the adherence between the counselor team and the full-time teacher team, including enterprise teachers, and forms a common education model.

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