

Quantitative Analysis of Influential Factors on Learning Engagement in Rural Teacher Education Programs

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Abstract: This study employs a quantitative approach to investigate the learning engagement of students in rural normal universities, set against the backdrop of broader policy initiatives aimed at improving the quality of rural education. It examines the cognitive, emotional, and behavioral dimensions of engagement, revealing significant differences based on factors such as grade level, urban-rural background, and family socioeconomic status. Through regression analysis, the study identifies key factors influencing student engagement, including family background, curriculum rigor, institutional support, learning motivation, and interpersonal relationships. The findings highlight the unique challenges and opportunities faced by rural teacher education programs, emphasizing the need for targeted strategies to enhance cognitive engagement and improve educational outcomes. By providing empirical evidence, this research contributes to discussions on teacher education reform and offers valuable insights for policymakers and educators committed to cultivating effective rural educators and addressing educational opportunity and quality gaps.

Keywords: Rural Teacher Education; Learning Engagement; Cognitive Engagement; Teacher Preparation; Educational Policy; Quantitative Research

1. Introduction

Under the background that the focus of compulsory education has shifted from "basic balance" to "quality balance", quality improvement is the focus of quality and balanced development of education. Teacher education is "the work machine of education, is the source of power to improve the quality of education".[1] In 2015, the Rural Teacher

Support Plan (2015-2020) that "the construction of rural teachers should be placed in the strategic position of priority development", and "local governments and normal colleges should strengthen localized training" to create "teachers rooted in rural areas". In response to the national policy, Jiangsu Province has enrolled rural teachers and targeted normal university students since 2016, aiming to cultivate a group of local rural teachers who are rooted in rural areas, willing to contribute, specialized and with comprehensive quality. However, the existing research shows that the rural teachers trained in Jiangsu province have many problems, such as lack of educational feelings, low comprehensive quality and insufficient teaching ability.[2]As an important reserve force of rural teachers, the training quality of rural teachers' oriented normal university students has attracted the attention of universities and scholars. As an important tool to reflect students' learning situation and measure the quality of college training, learning input has been flexibly applied in domestic and foreign studies. Based on this, expect through rural teachers directional students learning survey, help sponsored colleges fully understand the students learning status, and explore the factors affecting students learning investment, provide the factual basis for rural teacher education, promote the improvement of the rural orientation students training plan and development, further enhance the quality of rural teachers, improve the quality of rural basic education.

1.1 Concept and Theoretical Research of Learning Investment

The concept definition and dimension division of learning investment in academic circles have not been unified. At present, researchers generally advocate that learning investment is

studied as a variable with a multidimensional structure. Connell He was the first to construct a learning input structure from three dimensions of behavioral, emotional and cognitive input. He and his team developed the "Rochester School Assessment Package" (RAPS).[3]Fredricks et al. believe that learning engagement is a multidimensional structure involving behavioral, emotional and cognitive dimensions.[4]Schaufeli The team defines learning engagement based on the concept of work engagement, including vitality (visual), dedication (dedication), and focus (absorption).[5]Kuh defines learning engagement as the time, effort and effort students spend during the learning process.[6]Kuh regards learning investment as the result of the synergy of students' personal efforts and environmental interaction, that is to say, learning investment includes students' time and energy to actively participate in learning activities in and out of class, as well as students' perception of college support and teacher guidance.

Studying components of learning engagement can separate student behavior, emotion, and cognition when actually, these factors are dynamically embedded in individual individuals rather than isolated processes. Therefore, this study follows Kuh's learning input theory to investigate the learning input of rural teachers' oriented normal university students from a comprehensive perspective.

1.2 Measurement Research of Learning Investment

From the perspective of the survey subject, one kind is the teacher report method with educators as the main body. Common teacher-reported questionnaires are the Learning Behavior Scale (L B S) and the associated Preschool Learning Behavior Scale (P LBS). The other is the educated self-report, which is also a commonly adopted measure. Specifically, it can be divided into two categories. One is the universal learning input survey, such as the Academic Input Questionnaire (AES) developed by the University of Chicago, the Utrecht Work Input Scale (UWE-S) developed by Schaufeli et al., and the National Student Engagement Survey (NSSE) developed by Kuh et al. The second is the learning input questionnaire developed for special needs. For example,

Roblyer and Wiencke proposed the interactive quality assessment standard (RAIQDC) to measure the interaction degree between tutors and learners in a distance learning environment.[7]The measurement of learning investment in China is mostly based on foreign research, and the scale is adapted, such as the Chinese version of UWE-S adapted by Fang Laiitan and Shi Kan, and the NSSE-China Chinese questionnaire compiled by the Education Research Institute of Tsinghua University in China.[8-9]

Since the NSSE scale evaluates learning engagement through students' skills, emotions, interactions, and performance and is more applicable to traditional classroom settings, the preparation of the measurement tool was with reference to the NSSE-China. At the same time, considering the particularity of rural teachers oriented normal students, referring to Liu Yuanyuan's questionnaire "Research on Shanghai University Normal Students",[10]Delete and change the question items for the research object.

1.3 Study on the Influencing Factors of Learning Input

The influencing factors of learning input mainly involve individual factors, family factors and school factors. In terms of individual characteristic variables, the influence of cognitive need, learning self-efficacy, psychological capital, knowledge sharing, achievement goal orientation, gratitude, psychological resilience, and professional commitment on learning input. For example, Liao Youguo found that learning values and learning self-efficacy had a positive predictive effect on learning investment. In terms of family influencing factors, the influence of parenting style, parental monitoring, family socio-economic status, and family learning support on learning input is mainly discussed. For example, Tan Zheng et al. found that the level and quality of the parental independent support of migrant children had a positive predictive effect on the learning input of migrant children.[11]School-level factors mainly include teacher factors, peer factors and class environment and school environment factors. Zhang Kai et al. believe that the appropriate student-teacher interaction mode is conducive to stimulating students' positive emotional

experience, so as to improve students' emotional investment in learning.[12] Shernoff And Hagenauer found that the learning atmosphere of the class, the supervision and the management mode of the school will also affect students' learning investment. For example, if students can participate more in the policy and system, students will be more active in learning.[13-14]

The level of students' learning investment is the result of the long-term combination of internal and external causes, and students' individual, family and school are indispensable. Therefore, focus on the influence of individual factors, family factors and college factors on the learning input of rural teachers.

2. Study Design

2.1 Preparation of the Research Tools

2.1.1 Questionnaire item design

Based on the learning input theory of Fredricks, the NSSE-China (2011) was structured, and the three-dimensional model of rural teacher oriented normal university students was constructed, and the questionnaire "Research on learning Investment of S University Students" by Liu Yuanyuan (2014) was adapted. Learning investment includes three dimensions: cognitive input, emotional input and behavioral input, with a total of 68 projects. The influencing factors of learning input include five dimensions: learning motivation, college support, curriculum requirements, interpersonal relationship, and family background, with a total of 38 items.

2.1.2 Project analysis

Through stratified random sampling method, rural teachers and directed normal university students were selected from Jiangsu Y University to participate in the survey. A total of 86 questionnaires were collected, with a recovery rate of 100% and 80 valid questionnaires, with an effective rate of 93%. Wu Minglong (2000) believes that due to the special study sample, the number of pre-tests can be appropriately lower than the standard of "3-5 times the number of subscales"[15], The preliminary test sample basically meets the minimum proportion requirements proposed by Tinsley[16], The sample sources

include mathematics and applied mathematics (normal) (22), primary education (normal) (37), chemistry (normal) (20).

In order to investigate the suitability of the questionnaire, the initial questionnaire of the rural teachers' directed normal students was analyzed. The results showed that out of 68 items in the learning investment scale, 5 items did not meet the statistical criteria values of critical ratio or CR value; among the 38 items of the learning investment influencing factor scale, all items met the statistical criteria values of critical ratio and CR value. Therefore, 101 items were retained for the next analysis. Secondly, reliability analysis and CIC analysis of learning input and influencing factors. When the item score is significantly correlated with the total score, and the correlation coefficient is above 0.5, it is retained. The results show that the evaluation results of two items in the learning investment scale are not ideal and should be deleted; the evaluation results of learning factors can be retained. Therefore, the "Rural Teachers Directed Normal University Students Learning Investment Questionnaire" (forecast) finally retained 99 items.

2.1.3 Exploratory factor analysis

In the learning input scale, the KMO values of the three dimensions of learning input were 0.891, 0.834 and 0.878, with the sphericity test χ^2 The values were 2622.364, 544.722, and 614.071, respectively, and reached a significant level ($P < 0.001$), indicating that the sample was suitable for factor analysis. After inspection, the common degree of 61 items is greater than 0.5, and the factor load of 1 item in the cognitive input is less than 0.5, which needs to be eliminated. Based on the results of factor load matrix, 35 items of cognitive input form four public factors, emotional input 10 projects form two public factors, behavior input 15 projects form three public factors, the cumulative variance interpretation rate of 70.004%, 72.997% and 67.221% respectively, indicating the construction validity of the three factors of retained extraction meet the basic requirements. In the scale of influencing factors of learning input, the common degree of learning motivation, curriculum requirements, college support, interpersonal relationship and family background is greater than 0.5, and the factor load is greater than 0.7,

and all of them can clearly form a public factor to represent the measurement connotation of this dimension.

2.2 Survey Object

By stratified random sampling method, Y University's primary education (normal), mathematics and applied mathematics (normal) and chemistry (normal) were taken as the sampling units, and the rural oriented normal students were taken as the object of investigation and research. A total of 220 paper questionnaires were distributed and 196 were recovered, with a recovery rate of 89.1%. 140 questionnaires were collected online, with a recovery rate of 100%. After removing invalid questionnaires (missed or false answers), 321 valid samples were obtained, with an effective rate of 95.5%.

2.3 Data Processing

Statistical analysis of the data was performed with the help of SPSS 27.0 and AMOS 28 software. Firstly, descriptive statistics are used to analyze the learning situation of rural teachers' students; secondly, independent sample t-test and one-way variance analysis; then linear regression, the structural equation model is constructed to test the direct and indirect effects between the variables and

learning inputs. ^α After test, the overall internal consistent reliability coefficient of the learning input scale is 0.964, and the Cronbach's coefficient of the three dimensions is 0.964, 0.911 and 0.857 respectively; the overall internal consistent reliability coefficient of the learning input influencing factor scale is 0, and the Cronbach's coefficient of each variable is greater than 0, indicating that the questionnaire has good reliability. The fitting index of the learning input model is: RMSEA = 0.062,

^α $\chi^2/df = 2.237$, PNFI = 0.723, PCFI = 0.811; fitting model of learning input: RMSEA = 0.062, $\chi^2/df = 2.215$, PNFI = 0.82, PCFI = 0.869. The overall fit of the two models meets the requirements, and the standard error of each observed variable under the unstandardized estimation of the model (S.E.) The absolute value is greater than 0, indicating that there is no collinearity problem

between the various effects.

3. Results

3.1 Overall Situation of Learning Investment

The average investment of rural teachers' oriented normal students is 2.571, close to the middle value of 2.5, and the standard deviation is 0.479, indicating that the investment level of rural teachers' oriented normal students is general. In the three dimensions, the highest mean was behavioral investment (M=2.788), the lowest mean was cognitive investment (M=2.402), emotional and behavioral investment were slightly higher than the intermediate level, cognitive investment was lower than the middle level, and lower than the overall level of learning investment. In addition, the normal P-P diagram, learning input, cognitive input, emotional input, behavior input most points are scattered near the diagonal, said the measurement score distribution obey normal distribution, including learning input, cognitive input, emotional input and behavior input skewness coefficient is 0.426, 0.541, 0.192, 0.229, the skewness coefficient is greater than 0, indicating that the scores of the positive skewed distribution, skewness coefficient is the cognitive input, namely the majority of the rural teachers' directional normal cognitive input is lower than the medium level. In addition, the correlation of two pairs between the three dimensions of learning input is significant. The correlation coefficient is 0.786, 0.608 and 0.5060, all of which are greater than 0, indicating that they are positively correlated with each other, which conforms to the basic law of close combination of "knowledge, emotion, meaning and action" in the learning process. The correlation coefficient between cognitive input and emotional input is the highest, indicating that the relationship between students' emotional input and cognitive input is closer (see Table 1).

3.2 Individual Differences in Learning Investment

To understand whether the learning input of rural teacher-oriented normal students varies in demographic variables, one-way analysis of variance and independent sample t-test (see

Table 2).

Table 1. Descriptive Statistics and Correlation Matrix of The Learning Input of Rural Teachers' Oriented Normal University Students

variable	mean	standard error	skewness	2	3
1. Investment in learning	2.571	.4079	0.426		
2. Cognitive input	2.402	.07.53	0.541		
3. Emotional input	2.681	.5089	0.192	0.786**	
4. Behavioral input	2.788	.4099	0.229	0.608**	0.560**

Note: * means <0.05, ** means <0.01

Table 2. Descriptive Statistics and Demographic Differences of The Samples (M ± SD)

demographic variables		Cognitive input	Emotional input	Behavioral input	Learning input
sex	1 Male (N=84)	2.448±0.601	2.793±0.617	2.754±0.478	2.607±0.496
	2 Female (N=237)	2.384±0.511	2.641±0.574	2.799±0.508	2.557±0.472
	t	0.923	2.018	-0.722	0.81
	p	0.357	0.044*	0.471	0.419
grade	1 Primary year (N=57)	2.349±0.493	2.698±0.625	2.637±0.393	2.509±0.411
	2 Sophomore year (N=107)	2.458±0.519	2.715±0.562	2.712±0.401	2.586±0.435
	3 Junior year (N=99)	2.234±0.456	2.554±0.540	2.748±0.466	2.446±0.411
	④ Senior year (N=58)	2.633±0.640	2.816±0.654	3.147±0.638	2.814±0.624
	F	7.781	2.702	14.383	8.047
	p	0.000**	0.046*	0.000**	0.000**
	LSD	1=2=3<4	3<1=2=4	1=2=3<4	1=3<2<4
specialty	1 Primary education (N=161)	2.372±0.515	2.643±0.608	2.849±0.479	2.563±0.474
	2 Mathematics and Applied Mathematics (N=78)	2.416±0.581	2.640±0.601	2.701±0.546	2.549±0.517
	3 Chemistry (N=82)	2.447±0.540	2.797±0.530	2.752±0.481	2.606±0.455
	F	0.558	2.133	2.642	0.330
	p	0.573	0.120	0.073	0.719
Single type	1 Only child (N=185)	2.430±0.567	2.709±0.642	2.833±0.524	2.603±0.513
	2 Non-only child (N=136)	2.362±0.491	2.638±0.504	2.723±0.459	2.522±0.427
	t	3.763	10.656	4.101	5.404
	p	0.053	0.000**	0.044*	0.021*
Urban and rural types	1 Town (N=160)	2.461±0.582	2.717±0.609	2.861±0.53	2.633±0.515
	2 Rural area (N=161)	2.346±0.485	2.646±0.572	2.715±0.458	2.510±0.436
	t	6.853	1.022	6.732	6.102
p	0.009*	0.313	0.010*	0.014*	
place of domicile	1 South of Jiangsu (N=56)	2.507±0.660	2.784±0.688	2.866±0.596	2.659±0.577
	2 Suzhong (N=184)	2.366±0.506	2.629±0.591	2.797±0.490	2.545±0.469
	3 North Jiangsu (N=81)	2.410±0.509	2.728±0.499	2.716±0.440	2.569±0.424
	F	1.482	1.833	1.55	1.231
	p	0.226	0.162	0.214	0.293
family economic status	1 Food and clothing difficulties (N=42)	2.271±0.572	2.606±0.624	2.662±0.518	2.435±0.507
	2 Medium (N=138)	2.297±0.432	2.606±0.554	2.783±0.438	2.495±0.399
	3 Well-off (N=131)	2.518±0.57	2.751±0.582	2.796±0.523	2.657±0.500
	④ Rich (N=10)	2.871±0.737	3.133±0.771	3.293±0.640	3.053±0.651
	F	7.632	3.646	4.469	7.465
	p	0.000**	0.013*	0.004*	0.000**
	LSD	1=2<3<4	1=2<3<4	1=2=3<4	1=2<3<4

Note: * means <0.05, ** means <0.01

First, the significant difference of rural teachers in emotional input. The results of T test showed that the emotional investment of male rural teachers was significantly higher than that of female rural teachers' oriented normal students. In other words, male rural

teacher oriented normal students have a stronger interest and identity than female rural teacher oriented normal students.

Second, there are significant differences in the total level of learning input and the three dimensions. Post-hoc comparison results

show that cognitive input and behavioral input are significantly higher than those of other grades, and emotional input is significantly lower than those of other grades; learning investment is significantly higher than those of other grades, and sophomores are significantly higher than freshmen and juniors. Although the cognitive input and emotional input were lower than the other grades, the level of behavioral engagement did not decrease. It can be seen that the cognitive strategy application ability and professional identity of rural teachers' oriented normal university students did not increase with the increase of education years.

Third, different types of rural teachers and directed normal students have significant differences in the total level of learning investment and emotional input and behavioral input dimensions. The results of T-test show that the only rural teacher-oriented normal students are significantly higher than the non-only students in terms of the total level of learning investment, the dimension of emotional investment and behavioral input. In other words, the only rural teacher oriented normal university students not only have a stronger interest in their major, but have a stronger sense of identity as rural teachers, but also are more willing to actively participate in learning and participate in various learning activities.

Fourth, the total levels of cognitive investment and behavioral investment in the total level of learning investment between different urban and rural teachers. Specifically, the total learning input level and cognitive input and behavioral input of rural teachers with urban hukou are significantly higher than that of rural teachers. In other words, rural teachers with urban hukou have more accurate cognition and understanding of learning, are more flexible at using learning methods and strategies, and have higher participation in learning activities.

Fifth, different family economic status of rural teachers oriented normal students in the total level of learning investment and three dimensions are significantly different. The results show that the total investment level of students in different families and three dimensions are significantly higher than other types, while the well-off families are significantly higher than medium and

subsistence / poor families; the behavioral input dimension is significantly higher than other types, but there is no significant difference between well-off families and middle and subsistence / poor families. Rural teachers from rich families have the highest scores in learning investment and all dimensions, which shows that this group not only attaches great importance to learning, but also is willing to devote themselves to study.

3.3 Analysis of the Influencing Factors of Learning Input

It is found that learning motivation has a significant positive impact on learning input and three dimensions; interpersonal relationship and family background have a significant positive impact on learning input, cognitive input and emotional input; college support has a significant positive impact on learning input and emotional input; curriculum requirements have a significant positive impact on learning input and cognitive input. Through stepwise regression analysis, the final variables in the model were learning motivation, interpersonal relationship, curriculum requirements, school support and family background (see Table 3). In speaking, learning motivation, interpersonal relationship, curriculum requirements, college support and family background are important variables affecting learning input, and the model formula $Y_{\text{Learning input}} = 0.39 * X_{\text{academic motivation}} + 0.125 * X_{\text{interpersonal relation}} + 0.143 * X_{\text{Curriculum requirements}} + 0.081 * X_{\text{College support}} + 0.097 * X_{\text{family background}}$; Learning motivation, interpersonal relationships, curriculum requirements and family background are important variables influencing cognitive input, the model formula $Y_{\text{Cognitive input}} = 0.419 * X_{\text{academic motivation}} + 0.163 * X_{\text{interpersonal relation}} + 0.179 * X_{\text{Curriculum requirements}} + 0.105 * X_{\text{College support}} + 0.101 * X_{\text{family background}}$. In behavioral input, only learning motivation is statistically significant, while other coefficients did not reach statistical significance, so the influencing factors need to be further explored and analyzed. In addition,

from the perspective of the predictive power of each influencing factor, the most influential factor for the predictive power of cognitive input, affective input and behavioral input is the learning motivation. In summary, the learning investment of rural teachers' directed

normal university students is influenced by multiple factors, such as learning motivation, interpersonal relationship, curriculum requirements, college support, and family background.

Table 3. Multiple Regression Analysis of The Three Dimensions of the Influencing Factors and Learning

variable	metric	Learning input			Cognitive input			Emotional input			Behavioral input		
		B	t	p	B	t	p	B	t	p	B	t	p
academic motivation		0.390	12.556	0.000**	0.419	10.714	0.000**	0.436	10.423	0.000**	0.295	5.779	0.000**
interpersonal relation		0.125	4.958	0.000**	0.163	5.111	0.000**	0.089	2.607	0.010*	0.060	1.448	0.149
Curriculum requirements		0.143	4.430	0.000**	0.179	4.413	0.000**	0.076	1.756	0.080	0.098	1.851	0.065
College support		0.081	2.721	0.007*	0.033	0.867	0.387	0.279	6.923	0.000**	0.077	1.560	0.120
family background		0.097	3.672	0.000**	0.105	3.179	0.002*	0.101	2.844	0.005*	0.074	1.709	0.088
regression model	R ²	0.741			0.674			0.703			0.357		
	ΔR ²	0.737			0.669			0.689			0.347		
	F	180.593(0.00**)			130.081(0.00**)			149.028(0.00**)			34.947(0.00**)		
	D-W price	1.371			1.704			1.079			1.84		

Note: * means <0.05, ** means <0.01

3.4 Mechanism Analysis of the Influencing Factors of Learning Investment

3.4.1 Model test of the structural equations

In Y university of rural teachers directional students learning investment based on the survey data, in the structure of the equation model orientation path analysis as an analysis method, learning as a dependent variable, learning motivation and interpersonal relationship as intermediary variables, family background, college support, curriculum requirements for independent variables, examine the role of the influence factors on learning investment, to explore the rural teachers directional students learning into the mechanism of influencing factors. RMSEA=0.06, x²/ Df = 2.154, IFI = 0.914, TLI = 0.908, CFI = 0.914, indicating a good model fit.

Standardized coefficients between the variables are shown in Figure 1. Learning motivation, interpersonal relationship, curriculum requirements, college support and family background have significant positive effects on learning input; interpersonal relationship, curriculum requirements and school support have significant positive effects on learning input; family background

has significant positive effects on interpersonal relationship.

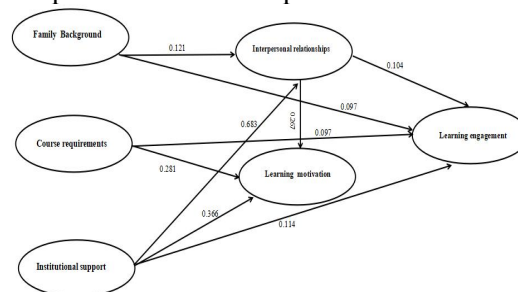


Figure 1. Path Diagram for Structural Equation Modeling Analysis

3.4.2 Mediation effect test

To further verify the mediation role of learning motivation and interpersonal relationship, bias correction Bootstrap sampling was repeated 5000 times, and 95% confidence intervals were calculated to verify the mediation role of interpersonal relationship and learning motivation in family background, curriculum requirements, school support and learning input. The results of mediation effect test are shown in Table 4.

The direct and total effects of the family environment on learning input were positive and reached the significance level, but the 95% confidence intervals of both indirect effects included 0, indicating that the two

specific indirect effects did not reach the significance level. The direct effect of "family environment — — learning input" was significant, but the two specific indirect effects with interpersonal relationship as the mediating variable were not significant, indicating that interpersonal relationship had no mediating role in this model, and the total effect was almost entirely from the direct effect of family environment on learning input.

The curriculum requires that the direct, indirect and total effects of learning input should be positive and significant. The direct effect of "curriculum requirement — — learning investment" is significant, and the "learning motivation" part mediates the influence of curriculum requirement on learning input. From the perspective of the relative effect proportion, the direct effect accounted for 40.42% of the total effect, while the indirect effect accounted for 59.58%, that is, the indirect effect is greater than the direct effect.

The direct and total effects of college support on learning input were both positive and significant. Specific indirect effects include three paths, "college support — — relationships — — learning input", "college support — — learning motivation — — learning", "college support — — relationships — — learning motivation — — learning", three specific indirect effects of 95% of the confidence interval does not contain 0, that three specific indirect effects reach significance level. The direct effect of "college support — — learning input" is significant, and the interpersonal relationship and learning motivation partly mediate the influence of college support on learning input. From the perspective of the proportion of the relative effect, the direct effect accounted for 24.52% of the total effect, while the three indirect effects formed by interpersonal relationship and learning motivation accounted for 75.48%, that is, the indirect effect is greater than the direct effect.

Table 4. Results of the Mediation Effect Test Estimated by the Bootstrap Method

		point estimate	95% Bias Corrected CI		p	Total effect
FE-LE	gross effect	0.125	0.053	0.208	0.001**	100.00%
	direct effect	0.097	0.030	0.006	0.030*	77.60%
	Specific indirect effects					
	FE-IR-LE	0.013	-0.001	0.038	0.075	10.40%
	FE-IR-LM-LE	0.016	-0.003	0.048	0.105	12.80%
CR-LE	gross effect	0.240	0.154	0.336	0.000***	100.00%
	direct effect	0.097	0.230	0.180	0.007**	40.42%
	indigo effect	0.143	0.069	0.225	0.001**	59.58%
CS-LE	gross effect	0.465	0.382	0.563	0.000***	100.00%
	direct effect	0.114	0.026	0.201	0.006**	24.52%
	Specific indirect effects					
	CS-LM-LE	0.187	0.114	0.278	0.000***	40.22%
	CS-IR-LE	0.071	0.010	0.054	0.003**	15.27%
	CS-IR-LM-LE	0.093	0.046	0.154	0.000***	20.00%

Note: * indicates <0.05, ** <0.01, and *** <0.001. FE= family environment, CR= course requirements, LM = learning motivation, IR = interpersonal relationships, CS= college support, LE= learning input.

4. Discussion

4.1 Basic Characteristics of Rural Teachers' Oriented Normal Students

4.1.1 The cognitive input of rural teachers' oriented normal university students is obviously insufficient

The learning investment of rural teachers' directed normal students is medium level, the cognitive input level is low, and the emotional input and behavioral input level are

significantly higher than the cognitive input. Cognitive input is a kind of thinking input, that is, when students need to face complex knowledge points and difficult skills to master, they should flexibly change their thinking mode and explore effective learning methods. Specifically, it includes the use of cognitive strategies, setting of learning goals, allocation of learning time, management and benefits of learning materials. The cognitive investment level of rural teachers is not high, indicating that students' ability in the utilization of

learning resources and the application of learning strategies need to be improved. For the oriented normal students of rural teachers, cognitive investment has great value and effect in the stage of independent learning at school or the stage of returning to teach. Although the existing research on students learning investment does not involve the rural teachers directional students this group, but Zhou Jiliang, XiaoHui studied the training status, found that rural teachers orientation professional learning cognitive decline, poor teaching ability, comprehensive quality is not high, this study to a certain extent for the cause analysis provides the data support.

4.1.2 "dislink" of three dimensions of rural teachers' learning investment

Correlation analysis shows that there is a significant positive correlation between the three dimensions of learning input, indicating that the increase of each dimension will have a positive promotion effect on the other dimensions. Existing research results also show that positive emotional input can promote the increase of students' cognitive input, and has a positive effect on behavior input, but in the results of this study, emotional investment and cognitive input appeared "broken" phenomenon, students' enthusiasm for learning and interest is not very good into cognitive and behavioral power, thus emotional great contrast between input and cognitive input. Nystrand and Gamoran believe that although cognitive engagement requires the assistance of both behavioral and emotional input, it also learns the most important part of the engagement.[17]The application of learning strategies, active participation in learning and deep learning are not only the abilities required by rural teachers during the training period in school, but also the necessary qualities and skills for them to return home to teach in the future. The high level of emotional investment indicates that rural teachers' oriented normal university students have a positive attitude towards their majors and colleges, while the low cognitive investment indicates that students have not learned how to use learning strategies to achieve deep learning. Giving full play to the value of emotional investment, promoting students to use learning strategies and participate in learning activities, and realizing

the "connection" between emotional investment and cognitive investment are of great significance for students' self-improvement and college talent training. In addition, the behavioral input, as students' explicit learning input, is significantly higher than the implicit emotional input and cognitive input, indicating that although students fail to flexibly use learning strategies, they can still actively participate in learning activities. If the cognitive input level is improved, the role of behavioral input will be further played.

4.2 Rural Teachers 'Oriented Normal University Students' Learning Investment Has Group Differences

The learning investment of rural teachers' oriented normal university students has certain "group characteristics", which shows significant differences in population variables such as grade, urban and rural types. In terms of gender, the cognitive input, emotional input and learning input of male and female students do not show differences, but the emotional input of male rural teachers is significantly higher than that of female rural teachers, and the results are consistent with Yang Yutong [18] and Li Jiabin[19]The research results are consistent. Due to gender thinking patterns and teachers' thinking patterns, it is generally believed that women are more emotional and more suitable for education. However, the results of many studies show that the emotional investment of male normal university students is higher than that of female normal university students. Furrer and Skinner believe that men are more aware of interpersonal and social relationships, and are more susceptible to the positive influence of teacher-student relationships.[20]It can be inferred that the higher emotional investment of male rural teachers is due to the influence of teacher-student relationship and peer relationship.

In grade, the scores of senior rural teacher oriented normal students are significantly higher in learning investment and all dimensions than that of other grades. Wen-qin cui[21]And Liao Youguo[22]Research results of college students' learning investment are verified the students learning investment in grade significant difference, but unlike

general college students, rural teachers orientation students learning short rise in freshman and sophomore, junior in decline, senior rising trend and higher than other grade, presents a "-medium-low-high" special change, including big to three change verified wang Yang[23]The conclusion of. This shows that with the rise of grade, rural teachers' oriented normal university students have a deeper understanding of their major, and their learning investment gradually increases. However, after three years of theoretical learning, students have not well mastered the learning methods, and their professional expectations and learning enthusiasm are difficult to maintain.

In terms of the type of only child, the only rural teacher oriented normal students are significantly higher than the only rural teacher oriented normal students in the total level of learning investment, the dimension of emotional input and behavioral input, with cognitive investment and differences. The reason for this result may be because the parents and elders give more care and expectation to the only child, and provide more financial and spiritual support in life and study. In addition, the only child is more likely to stay in their hometown because of the responsibility to support their parents, because they shows higher behavioral and emotional input.

In terms of urban and rural types, rural teachers from cities and rural areas did not show significant differences in emotional input, but the total level of learning investment, cognitive input and behavioral investment of rural teachers from urban areas were significantly higher than that of rural students. Tan Xiaohong[24]It is said that compared with rural students, urban students may be more adapted to college life and be more confident in classroom participation and social practice. Students from rural areas will often be unknown in their studies and need longer time to adapt to the new environment.

In terms of family economic situation, rural teachers oriented normal students from different families show obvious differences in learning investment and various dimensions. The overall performance of learning investment is "rich > well-off > medium = food and clothing / difficulty". According to the family investment theory, the family

economic situation reflects the economic capital, cultural capital and social capital in the family environment. Students from higher families can enjoy the material support and spiritual support from their families, and get more favorable resources and information in their career development. At the same time, in families with general economic conditions, parents will lack time with their children due to work pressure, so in the empathy ability and interpersonal skills of these students are obviously weaker than that of students with better economic conditions.[25]Therefore, it can be speculated that the rural teachers in this study, which may be affected by their parents and family living standards.

4.2 The Learning Investment of Rural Teachers' Oriented Normal University Students Is Influenced by Multiple Factors

4.2.1 Family background, curriculum requirements, and college support will significantly and positively affect the learning input of rural teachers' oriented normal university students

Family background significantly affects the investment of rural teachers' directed normal university students. Family background involves the highest education level and income of parents, indicating that the education level of parents will affect their children, and then affect their children's learning investment. This conclusion verifies the views of scholars such as Shi Leishan. [26]Family background plays an important role in the image of the choice of college major. The targeted training plan for rural teachers belongs to the advance batch of college entrance examination admission in Jiangsu Province, which is slightly different from the general college entrance examination application. Students will refer to their parents' opinions when filling in the application form and choosing their majors. Higher educated parents are more proactive in their professional information and enrollment plans; rural and less educated parents had more information in application and major choice.[27]After students enter the university, highly educated parents can provide career planning guidance, provide multi-channel information, help students set up learning goals, increase students' learning investment, and avoid learning burnout and confusion.

The curriculum requirements significantly affect the investment of rural teachers' oriented normal university students. In the three dimensions, curriculum requirements only show significance to cognitive input, indicating that curriculum requirements have a positive impact on students' cognitive input, that is, students' cognitive input will increase with the improvement of curriculum requirements. Liu Yujing and Yang Yang believe that compared with teachers' oral explanation, students' attitude towards the course and the level of learning investment are oriented by curriculum requirements. When the curriculum requirements are more specific and clear, students are easy to find the direction of efforts and are more willing to increase investment in learning.[28] It can be concluded that the specific course requirements can help students to determine the learning objectives and thus increase the learning input; Meanwhile, the specific course requirements can enable students to invest more in the courses with poor learning quality and insufficient knowledge points, and for the courses that have received good feedback, students can acquire independent learning methods and techniques in the process of meeting the course requirements.

College support has significantly affected the investment of rural teachers in oriented normal university students. College support is significant for emotional input, indicating that college support has a positive impact on students' emotional input. In other words, the more the support provided by the university, the more students will invest and gain in knowledge, emotion and skills, which is similar with Luo Yan[29] and Wang Shu[30]. The research results are consistent. According to the self-system theory, schools influence students' learning investment by meeting students' learning needs and determining their learning goals.[31] Therefore, when scholars study students' learning investment, they will include school factors into the analysis framework. School is the main position for students to study and live. Compared with primary and middle school students, college students spend a longer time in school and have a closer relationship with the school. Therefore, the emotional support and material support to students have a significant impact

on students' learning input.

4.2.2 Learning motivation and interpersonal relationship will significantly and positively affect the learning input of rural teachers' directed normal university students

Both learning motivation and interpersonal relationship have a significant positive impact on the learning input of rural teachers' oriented normal university students. The predictive power of learning motivation on cognitive input, affective input, and behavioral input was 41.9%, 43.6%, and 29.5%, respectively, indicating that learning motivation had a greater influence on implicit cognitive input and emotional input. Raza et al. found that teaching cases can stimulate students' learning motivation and then affect students' learning input. In the three dimensions of learning input, the predictive power of learning motivation on cognitive and emotional input is greater than behavioral input, which is consistent with the results of this study.[32] In addition, among the sources of learning motivation, external motivation (parental expectation (M=2.74) and classmate influence (M=2.86)) scored slightly higher than internal motivation (exploration knowledge interest (M=2.66), self-improvement (M=2.75) and sense of social mission (M=2.68)), while external motivation became the main source of learning input was difficult to maintain for a long time. Internal learning motivation comes from students or learning activities themselves, and only by stimulating students' internal learning motivation can they promote students' lasting and voluntary learning.

Interpersonal relationship is the psychological tendency and corresponding behavior tendency formed in students' communication with others in school. Long Sanping believes that good interpersonal relationship can cultivate students' investment in learning, so as to improve their academic performance, and then encourage students to be more engaged, and form a circular effect of active learning input.[33] When the interpersonal relationship is harmonious, the students are more willing to communicate and cooperate with teachers, actively participate in the learning activities inside and outside the class and various activities organized by the colleges and universities, and at the same time gain the sense of belonging and identity of

rural teachers in the collective.

Interpersonal relationship and learning motivation are connected mutually. Wang Jianquan believes that the relationship between interpersonal relationship and students' learning motivation is mutual, and the harmonious relationship between teachers and students is conducive to strengthening students' learning motivation.[34]The way of equal trust between teachers and students, the atmosphere of helping each other between students, and whether students' impression of teachers is good or bad will all affect students' learning motivation. To build a harmonious campus atmosphere and strengthen the interaction between teachers and students and students are effective measures for students to gain a sense of identity and belonging in the collective, so as to stimulate their learning motivation. Meanwhile, the excellent qualities of students and teachers will influence students and stimulate their consciousness and behavior of hard study.

4.3 Learning Motivation and Interpersonal Relationship Have an Intermediary Effect

Learning motivation plays a mediating role between curriculum requirements and learning input. When the curriculum requirements increase moderately and the course is more challenging, students' interest in learning and their awareness of self-improvement will be stimulated, thus strengthening the learning motivation and promoting the increase of learning investment. In the NSSE questionnaire, the "academic challenge level" expresses the role of the curriculum requirements, believing that the school can improve the investment level of students by emphasizing the curriculum requirements and learning standards, and thus improve their academic achievement. Chen Baosheng, minister of Education, also proposed that to "reasonably increase the burden" of college students, the lack of curriculum requirements should often be regarded as "water lessons" and lack of academic pressure and learning motivation, so as to reduce cognitive investment. Therefore, higher curriculum requirements and challenging academic tasks can stimulate students' interest in learning and strengthen their learning motivation, so as to promote students to actively engage in learning.

Both learning motivation and interpersonal relationship play an intermediary role in college support and learning investment. When rural teachers directional students get full college support, they have the opportunity to participate in all kinds of learning activities, can also to contact with professional class teachers, mature rural teachers, in explore knowledge and self improvement, multi-channel help, and the sense of accomplishment will further stimulate students' learning motivation, promote the increase of learning investment. At the same time, school leaders and teachers give students enough material support and humanistic care, which is more conducive to building a harmonious and inclusive campus atmosphere. Students' support and trust in the group will promote the formation of harmonious interpersonal relationship between teachers and students, and students' satisfaction and happiness in school will also be enhanced, so as to devote themselves to study.

In addition, learning motivation and interpersonal relationship play a role of chain mediation between college support and learning input. The higher the support degree of colleges and universities, the more harmonious the relationship between teachers and students, and the greater the influence of students and teachers on them. In the process of interpersonal communication with teachers and students, students realize the feasibility and necessity of self-improvement and knowledge exploration, so as to stimulate learning motivation and increase learning investment. At the same time, it also reveals the connection between interpersonal relationship and learning motivation. Three indirect effect of proportion, according to interpersonal play the intermediary role is significantly lower than learning motivation, that even with the full support, harmonious interpersonal relationship on students learning influence is limited, to promote students continue to learn, realize platform support and maximize the utilization of resource supply, still from the learners' own learning motivation.

5. Conclusion

According to the above research, to improve the learning investment of rural teachers

'oriented normal students, we can improve metacognitive ability, strengthen internal learning motivation, and improve interpersonal relationship in school, so that rural teachers' oriented normal students can better integrate into the learning environment, enhance their interest in learning, and promote the improvement of learning investment.

5.1 Improve the Metacognitive Ability of Rural Teachers' Oriented Normal University Students

Schen's principle of "reflection in activities" holds that, based on specific educational scenarios, targeted problems in situations. This kind of reflection from activities can not only help educators acquire practical knowledge, but also improve their critical thinking ability, problem-solving ability and environmental adaptability.[35]For students, the completion of each homework and the training of the trial lecture are the process of practice. Timely reflection on the action process, and recording in the form of teaching reflection and diary, are all effective ways to help themselves improve their metacognitive ability, critical thinking ability and practical ability. At the same time, teachers should guide and help students to strengthen the improvement of metacognitive ability. For example, courses for the analysis of teaching materials and curriculum standards of primary and secondary schools are offered to guide students to read textbooks and write teaching plans, and experienced rural teachers are arranged to guide students to lecture and try lectures, so that students can learn to apply learning strategies, improve metacognitive ability, and solve practical problems through the knowledge they have learned. In short, it is more important to make students become learning learners than simply teaching knowledge and skills.

5.2 Strengthen the Internal Learning Motivation of Rural Teachers' Oriented Normal University Students

Learning motivation is the source of development motivation within students. The enhancement of learning motivation can further play the role of curriculum requirements and college support, while the curriculum requirements and college support can further strengthen students' learning

motivation. On the one hand, training colleges and teachers should create relaxed learning, practice and living environment for rural teacher normal students, provide more diversified and personalized curriculum resources and teaching methods, fully respect the subjectivity of rural teacher normal students, and arouse their interest and curiosity in knowledge learning; on the other hand, colleges and universities should encourage and support rural teacher normal students to actively participate in educational practice activities. Colleges and universities should give full play to their own advantages and rely on local rural schools to improve the education practice system of rural teachers oriented normal students. In addition to centralized teaching practice, rural teachers of all grades are organized to go to rural schools in the city to observe and study and educate. Observe and learn from the educational experience of others, reflect and internalize in imitation, with the confusion and harvest in the internship, and found in the next internship and verification, forming a cycle of "internship-internship-internship".

5.3 Improve the Interpersonal Relationship of Rural Teachers and Oriented Normal University Students

Interpersonal relationship is the "catalyst" for the improvement of students' learning investment. Building an equal and respectful school interpersonal relationship can stimulate students' learning motivation, and then promote the increase of their learning investment. The improvement of interpersonal relationships in schools is also inseparable from the support of colleges and teachers. First of all, colleges and teachers should adhere to the principle of "equal waiting for students", and give rural teachers equal educational expectations and management requirements for oriented normal students and non-oriented normal students. At present, all the normal university students in Y University belong to the secondary colleges, and there is no separate school of teacher education established. There is a small number of rural teachers and the targeted normal university students are divided in different campuses, and the students are separated and unfamiliar. In this regard, a department responsible for the management of rural teachers, to their

advantages in rural teacher education and subject education, and hold the symposium as the intermediary to increase the sense of belonging and identity of rural teachers oriented normal students.

Secondly, schools should play the role of intermediary and regulation, and build an online interaction platform for rural teachers' oriented normal university students and staff. The relationship between university counselors and course teachers and students is often "one to many". It is difficult for teachers to take into account the needs of every student, and students also reduce the degree of interaction between teachers and students due to the limitation of time and space. Schools should practice the concept of "student-oriented", rely on big data analysis technology, build an online interaction platform for teachers and students, timely and effectively deal with all kinds of students' consultation, feedback and suggestions, enhance the interaction degree and learning satisfaction between teachers and students, and then better invest in learning.

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