

# An Investigation of the Internal Mechanism of Self-efficacy in Educational Apprenticeship of Teacher-training Students in Higher Education

## --Taking a Major Teacher Training University in China as an Example

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**Abstract.** Teacher education internship is an important way to improve teacher education students' practical skills, and it is closely related to the increase of teacher education students' self-efficacy and other psychological qualities. In this article, 437 teacher trainees from eight different majors at a major teacher training university in China were used to examine the internal mechanisms of teacher trainees' self-efficacy and find strategies to improve their self-efficacy in education internship. The study found that (1) teaching strategy efficacy, classroom management efficacy, and student engagement efficacy significantly and positively affected teacher educators' self-efficacy; (2) teaching strategy efficacy was positively related to classroom management efficacy; (3) classroom management efficacy was positively related to student engagement efficacy; and (4) classroom management and student engagement required the collaboration of parents and schools. In this regard, it is suggested that universities should pay attention to the teaching of theory and practice, teacher educators should consciously use the knowledge of teaching strategies and do a good job in classroom management, and home and school should reasonably help students to participate in the classroom to improve teacher educators' self-efficacy in all aspects.

**Keywords:** Teacher Trainees Self-efficacy, Educational Apprenticeship, Teacher Trainees Self-Efficacy Educational Apprenticeship.

## 1. Introduction

Teacher trainees are the first-line practical teaching talents and the reserve of a large number of excellent teachers, with two identities of "students" and "prospective teachers". In 2018, the Ministry of Education issued the Opinions on the Implementation of the Excellent Teacher Training Program 2.0, which pointed out that "within five years, the quality of practical teaching of teacher-training students should be significantly improved" and "a sound practical teaching system should be established throughout the whole training process." [1]. As the most common and representative educational internship in educational practice, it is an important way for teacher-training students to get in touch with front-line educational situations. The Action Plan for the Revitalization of Teacher Education (2018-2022) explicitly includes as one of its goals and tasks "to carry out apprenticeship and internship for teacher-training students and to focus on cultivating their sense of professional identity as teachers" [2]. Although the top-level design has indicated the development trend of practical teaching for teacher trainees and its goal of cultivating professional identity, and the existing studies have shown that educational internship is an important link between educational theory and practice for teacher trainees, and it is important for teacher trainees to understand the educational ecosystem [3]. However, some institutions have problems such as the apprenticeship being formal and the lack of evaluation mechanisms for its effectiveness [4]. Thus, from the perspective of teacher trainees, an investigation and analysis of the effectiveness of educational apprenticeship satisfaction

is helpful to improve the problems of the existing apprenticeship system, which is not very operative and not effective, and to provide a reference for improving the educational apprenticeship of teacher trainees.

Based on this, this paper explores the mediating role of self-efficacy between apprenticeship satisfaction and readiness to teach in the context of the reform of teacher-training programs, so as to provide a reference for improving the quality of teacher traineeships and enhancing teacher-training students' practice quality skills.

## 2. Literature Review

Education in terms of training objectives focuses on defining what kind of person to train, what kind of social work and what kind of educational qualities to train, pointing to the requirements of the profession or position that students will be engaged in in the future [5]. Among them, teacher education requires careful educational and pedagogical design because of its specialized nature of training talents to go. Coupled with the dual identity of university students and prospective teachers, teacher educators' own experiences and reflective behaviors will have a subtle influence on future teaching practice [6], specifically including teacher educators' perceptual understanding of basic education, the transformation of professional theoretical knowledge to teaching skills and the enhancement of teaching practice ability and teacher professionalism [7], thus Enhancing cultivation of teaching skills of normal students, improving their practical ability to a large degree are of great practical significance for promoting reform of normal education and improving the quality of talent cultivation[8]. As a special course to enhance the practical ability of teacher-training students, educational internship is an important educational link for teacher training colleges and universities to cultivate qualified teachers [9] and has an important role in enhancing professional knowledge and skills related to educational theory of teacher-training students[10]. Firstly, educational internship is a prerequisite for obtaining teacher certification [11], and although different teacher training colleges and universities have different professional training objectives and different requirements for students' basic qualities, they all focus on cultivating students' practical teaching ability and practical hands-on ability [12], thus it is clear that educational internship is a cultivation path for teacher training students to improve their soft and hard skills. Secondly, education internship provides a process of deep integration of theory and practice, and it runs through the whole process of teacher training [13], which is conducive to the cultivation of teachers with outstanding ideas and even outstanding contributions, and thus improves the quality of teacher education. However, domestic teacher training colleges and universities are generally facing the problems of "difficult educational internship for teacher trainees, difficult post-service professional development for teachers, and difficult research for subject pedagogy teachers", but in the process of internship, teacher trainees communicate with students, but international studies have shown that educational internship has the problems of poor teacher interaction and inappropriate arrangement of teaching contents in schools [14], The conflict between teachers' expectations and the internship school may lead to tension, frustration, and frustration, which in turn leads to low satisfaction with educational practice and affects their professional identity [15]. In 2017, China launched the accreditation of teacher training programs, which requires the implementation of quality monitoring of the whole process of educational internship practice and the development of educational practice evaluation standards, so it is representative to select a major teacher training university in China to conduct the study. as elementary and middle school teachers in the future, normal university school teacher in the future, normal university student' mental education ability will influence the qualification and effect of mental education of Normal university student' mental education ability can be enhanced by practical training curriculum.[16] Self-efficacy is another important psychoeducational competency that plays an important role in teacher teaching [17], it is a teacher educator's belief in his or her ability to positively influence student learning, and it is an important internal motivational mechanism for teacher educators to develop autonomously [18], the stronger the self-efficacy the stronger the teacher

educator's sense of professional identity [19], and teacher educators with high self-efficacy have higher beliefs about successfully reaching learning goals, and when they encounter bottlenecks they can choose appropriate ways to deal with bottlenecks, make plans to break down stress, find effective strategies to solve problems, and avoid learning burnout [20] [21]. It can be seen that self-efficacy has a unique influence on teacher educators and their future careers, probably because teacher educators with high self-efficacy in general have higher beliefs about successfully reaching learning goals, can choose appropriate ways to deal with bottlenecks when they encounter them, make plans to break down stress, find effective strategies to solve problems, and avoid learning burnout need to be activated and reinforced. In specific practical operations, scholars point out from the theoretical level that training and enhancement can be conducted in three dimensions: teaching strategy efficacy, classroom management efficacy, and student engagement efficacy [22].

In summary, teacher education is a special part of teacher education, and educational internship, in turn, as an important form of curriculum for the practical quality training of teacher trainees, has an enhancing effect on the comprehensive ability of teacher trainees. Therefore, this paper takes teacher education internship as an entry point to explore the inner mechanism of teacher trainees' self-efficacy after education internship, and discovers ways to enhance it from teaching strategy efficacy, curriculum management efficacy, student participation efficacy and their combinations, in order to provide suggestions for the improvement of teacher trainees' psychological quality from the perspective of the endogenous nature of self-efficacy.

### 3. Data Analysis

#### 3.1 Research Object

In order to investigate the current situation of the influence of teacher training students' internship on their self-efficacy, 437 questionnaires were distributed to undergraduate students from key teacher training colleges in Guangdong, including Chinese, Mathematics, English, Physical Education, Music, Geography, Physics, Chemistry and Biology. 415 valid questionnaires were received, with an effective rate of 94.97%.

#### 3.2 Research tools

The use of a mixed research approach has good application in enriching the experimental participants, verifying the validity of the instrument, evaluating the effect of the intervention, and increasing the significance of the study. [2] based on Megan Tschannen-Moran and Anita Woolfolk Hoy proposed that teacher educator self-efficacy includes three dimensions of teaching strategy efficacy, classroom management efficacy, and student engagement efficacy three dimensions. The questionnaire was modified and filtered using the Teacher Self-Efficacy Short Form as a substrate to create the "Effect of Teacher Training on Self-Efficacy Scale". The questionnaire consisted of six major questions, including three dimensions of teaching strategy efficacy, classroom management efficacy, and student engagement efficacy, in addition to personal information. "Effective teaching strategies can improve the effectiveness of teaching; "classroom management effectiveness" refers to classroom management ability and classroom activity design. As the basic unit of school management, the class is a small collective, and management plays a pivotal role. The "student participation effectiveness" includes building students' creativity and criticality. In order to prevent the emergence of a large number of ambiguous middle items such as "uncertainty", the scale was scored on a four-point scale, with all questions being scored positively. The reliability coefficient was 0.838 (>0.8), and the internal consistency coefficient of each construct was greater than 0.7. The KMO value was 0.878 (>0.8), with good reliability and validity. For the qualitative interviews, considering the influence of economic culture, social capital, and resource allocation on labor literacy, six teacher-training students from different schools, majors, grade levels, and different genders in Guangdong were selected to be representative.

### 3.3 Research Methodology

The questionnaire was processed using SPSS 26.0 and the statistical methods used were mainly descriptive analysis, linear regression, correlation analysis and t-test to investigate the role of the three dimensions on total self-efficacy, the role between the three dimensions, and the significant differences in the different dimensions.

### 3.4 Data Analysis

#### 3.4.1 Overall characteristics descriptive statistics

In the valid sample, the reality status of the questionnaire fillers was 50.10% for postgraduate students, 47.20% for those engaged in school teaching profession, and 2.70% for those engaged in out-of-school education; 38.30% for liberal arts and 61.70% for science subjects in terms of subject attributes; 28.20% for the first 1/3, 62.20% for the middle 1/3, and 37.80% for the last 1/3 in terms of academic level. The mean value of teaching strategy efficacy was 2.84 with a standard deviation of 0.46, the mean value of classroom management efficacy was 2.73 with a standard deviation of 0.5, and the mean value of student engagement efficacy was 2.88 with a standard deviation of 0.51, which shows that all three efficacies were higher and less discrete for teacher educators.

**Table 1.** Results of descriptive statistical analysis (1).

Variables	Option	Frequency	Ratio
Current Status	Graduate Student	208	50.1%
	Engaged in in-school teaching	196	47.2%
	Engaged in off-campus educational institutions	11	2.7%
Major	Liberal Arts	159	38.3%
	Science	256	61.7%
Achievement Ranking	First 1/3	117	28.2%
	Middle 1/3	141	34.0%
	Back 1/3	157	37.8%

**Table 2.** Results of descriptive statistical analysis (2).

Variables	Min	Max	M	SD
Sense of efficacy in teaching strategies	1.00	4.00	2.84	0.46
Sense of efficacy in classroom management	1.00	4.00	2.73	0.50
Student Engagement Effectiveness	1.00	4.00	2.88	0.51

#### 3.4.2 The role of the three dimensions on the aggregate - linear regression

The Pearson correlation coefficient showed that the correlation coefficient between teaching strategy efficacy and self-efficacy was 0.714\*\*, classroom management efficacy and self-efficacy was 0.562\*\*, and student involvement efficacy and self-efficacy was 0.618\*\*, which showed that teaching strategy efficacy, classroom management efficacy, and student involvement efficacy were highly positively correlated with teacher educators' self-efficacy. relationship. Therefore, theoretically, a one-dimensional regression model can be developed. Where,  $t_1$ ,  $t_2$ , and  $t_3$  represent teacher educators' teaching strategy efficacy, classroom management efficacy, and student engagement efficacy, respectively, and  $Y$  represents teacher educators' self-efficacy level.  $a$  and  $b$  are unknown parameters of the model, which are called regression constants and regression coefficients, respectively. The parameters  $a$  and  $b$  in the model can be found by least squares (OLS) based on the historical data (samples),

$$b = \frac{n \sum tY_t - \sum t \sum Y_t}{n \sum t^2 - (\sum t)^2} \quad (1)$$

Where n is the sample size and the other letters have the same meaning as the above equation.

Regression analysis was conducted on the data using one-dimensional linear regression with strict controls for reality, subject attributes, and academic level. The results showed that the standardized regression equation for teaching strategy efficacy and teacher educator self-efficacy,  $Y=0.715t_1$ , where  $\text{Sig}(F=107.320)=0.000<0.01$ ; the standardized regression equation for classroom management efficacy and teacher educator self-efficacy,  $Y=0.568t_2$ , where  $\text{Sig}(F=48.462)=0.000<0.01$ ; student The standardized regression equation for student engagement efficacy and teacher educator self-efficacy,  $Y=0.618t_3$ , where  $\text{Sig}(F=63.580)=0.000<0.01$ , indicated that the regression model was statistically significant and that teaching strategy efficacy, classroom management efficacy and student engagement efficacy were linearly and positively related to teacher educator self-efficacy, respectively.

### 3.4.3. Interaction between the three dimensions-correlation analysis

SPSS 26.0 was applied to analyze the data for correlation. The results of the means, standard deviations, and correlation coefficients for each variable are shown in Table 2. The results showed that instructional strategy efficacy was significantly and positively correlated with classroom management efficacy ( $r = 0.124, p = 0.01$ ), classroom management efficacy was significantly and positively correlated with student engagement efficacy ( $r = 0.123, p = 0.01$ ), and instructional strategy efficacy was weakly correlated with student engagement efficacy ( $r = 0.078, p > 0.1$ ).

**Table 3.** Results of correlation analysis.

Variables	M	SD	1	2	3	4	5	6
1.Education/practice status	1.530	0.551	1					
2.Subject type	1.620	0.487	-0.400	1				
3. academic level	2.100	0.808	-0.250**	0.014	1			
4. Teaching strategy effectiveness	2.841	0.461	-0.270	0.000	0.065	1		
5. Classroom management effectiveness	2.735	0.500	-0.068	-0.065	-0.074	0.124*	1	
6. Student involvement effectiveness	2.883	0.512	-0.019	-0.019	0.026	0.078	0.123*	1

Note: (1) \* indicates  $p < 0.10$ , \*\* indicates  $p < 0.05$ , and \*\*\* indicates  $p < 0.01$ .

It can be seen that the improvement of teacher educators' teaching strategy efficacy, classroom management efficacy, and student engagement efficacy during the educational internship process helps to enhance teacher educators' self-efficacy and achieve better practice and psychological growth. Among them, the improvement of one side of teaching strategy efficacy and classroom management efficacy, classroom management efficacy and student engagement efficacy have a facilitating effect on the other side. When conducting teacher education internships, the importance of the cascade of the three is important in order to have a more comprehensive improvement of self-efficacy. For example, teacher educators can learn the theory of instructional strategies before the internship, use and revise it in classroom management and student engagement management during the internship, and strengthen their self-efficacy with each revision and improvement.

### 3.5 Interview analysis

In order to further enrich the quantitative findings, the study adopted a semi-structured interview with six teacher-training students from different grades and majors in physics, chemistry, language, geography, and biology teacher training, focusing on "teaching strategies", "classroom management", and "student participation" in their educational internship, to understand the difficulties they encountered and the improvement methods they needed, and to summarize their views on educational internship and practicum into two categories, namely conservative and positive, by searching "word frequency analysis" and "opinion analysis" after detailed reading.

### 3.5.1 Teaching training in higher education needs to link theory with practice

Teaching strategy efficacy, as an important aspect that affects teacher trainees' self-efficacy, needs to be nurtured and enhanced before and after educational practice. Prior to educational practice, universities conduct courses related to teaching strategies for teacher educators as a way to standardize their instructional design and teach them effective teaching methods and strategies, and *"the course content is very helpful, overall in terms of theory, skills" (T4)*, and the teacher educator skills conducted within the university training has been somewhat effective. However, when teacher educators participate in educational internships, the on-campus training programs gradually reveal their inadequacy, and *"the course knowledge can only be described as theory first, and it is actually difficult to apply it in actual teaching" (T2)*. Teacher trainees also demand more from university teacher education training programs, *"there may be a need for more training in practical experience courses of successful and popular teachers, training in statistical studies of the preferences and personalities of students of different ages nowadays" (T1)*.

### 3.5.2 Classroom management lacks collaborative home and school governance

When asked about classroom management during their educational internships, respondents showed a consistent need for collaborative help from home and school to manage the situation. For example, if there are disruptive students in the classroom, teacher educators have said that they will guide and regulate the students with respect, but they need the assistance of parents and schools. *"Parental cooperation is also important, classroom management in the home school synergy is weak, the main body of the classroom or the students and teachers themselves, parents play a role mainly in the after-school" (T5)*. Some teacher-training students mentioned that they would try to communicate with parents through elementary school classroom teachers, so that parents could establish an image of respect for teachers and classrooms in front of students, thus promoting students to learn to cooperate with classroom management in a subtle way.

### 3.5.3 Students' willingness to participate needs to be guided by the school

The increase in student engagement efficacy is beneficial to teacher educators' self-efficacy, and respondents reported that they value student engagement and use it to measure classroom effectiveness. *"I would focus on improving communication with students, increasing classroom interaction, and conducting activities such as flipping the classroom" (T4)*. However, *"students are difficult to motivate and uncooperative" (T6)*, which still occurs in the internship. The elementary school needs to develop its own teaching atmosphere and the help of the elementary school classroom teacher. *"Schools and classroom teachers need to work together to provide extracurricular extensions and science activities for students to increase their interest in knowledge so that they can increase their willingness to participate" (T3)*.

In addition, the distribution of the word cloud shows that "Synergy" (including Home-School Collaboration, University-Elementary School Matching), "High School Training" (including Course Training Learning, Basic knowledge learning) and "Multi-party Support" (including Parental Support, Classroom teacher support) are the top three terms in terms of attention.



Figure 1. Word frequency graph.

## 4. Discussion

The educational apprenticeship in teacher training is an important part of practical teacher education, and it has become a critical issue to enhance the practicality of teacher trainees in education and thus their self-efficacy and psychological quality.

### 4.1 Universities should focus on teaching the combination of theory and practice

Empirical studies show that teacher trainees' teaching strategy efficacy will affect their self-efficacy in educational internship, and teacher trainees need school training programs to integrate theory and practice more closely in order to truly enhance their educational skills and practical knowledge. Therefore, when teacher training is conducted at teacher training universities, the content of the training should not be limited to theoretical teaching strategies but can include training of teacher training students in contextual simulation and experience sharing sessions of outstanding teachers, so as to strengthen the cultivation of application-oriented talents. At the same time, the integration of education and training should be emphasized. The professional cognition and self-efficacy of teacher trainees before and after teaching may differ, such as the disconnection between teaching theory and teaching practice, so it is necessary to build an integrated educational model before and after practice and construct a three-dimensional curriculum system.

### 4.2 Teacher trainees should consciously enhance their sense of self-efficacy

Research indicates that teaching strategy efficacy is positively related to classroom management efficacy and classroom management efficacy is positively related to student engagement efficacy, and they both positively influence self-efficacy. Therefore, teacher educators can improve their self-efficacy by improving one of the components. For example, by consciously using teaching strategies to prepare for classroom management and by engaging students through clever classroom interactions, they can consciously integrate them with each other to enhance teacher educators' self-efficacy during the internship.

### 4.3 Emphasis on multi-body participation in management

It has been discovered that classroom management effectiveness and student participation effectiveness play an important role in teacher trainees' self-efficacy in education practice, and it is difficult for teacher trainees to achieve results alone, therefore, collaborative governance among teacher trainees, parents and schools is needed. The importance of synergy among parents, colleges, and elementary schools was mentioned several times in the interviews, and a strong need for more

educational practices was demonstrated. So teacher training schools should help more students break through the limitations of educational space, and continuously strengthen the practice of teacher trainees to help them go out of school and into primary and secondary schools to apply teaching strategies in practice.

In summary, as an important way of practical education, teacher internships can optimize the effectiveness of teacher educators' teaching strategies, classroom management, and student engagement through the improvement and development of schools, elementary and secondary schools, thus enhancing teacher educators' self-efficacy. At the same time, the effectiveness of educational internships can be further ensured through collaborative governance of home and school to integrate professional knowledge into the lives of teacher trainees in order to improve the quality of teacher training practice and respond to the teacher training program in the 2018 national top-level design. Due to the impact of the epidemic, the internship should be supplemented with a better back-up program or a systematic and operational online internship for existing surveys.

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