

Chinese Pre-Service Physical Education Teachers Engagement in Learning Pedagogical Skills: Input to a Development Training Program

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Abstract: The level of investment in learning Pedagogical Skills by pre-service physical education teachers in higher education directly affects the quality of teacher cultivation. This study aims to analyze and compare the current situation and influencing factors of the investment in learning Pedagogical Skills by pre-service physical education teachers in higher education, as well as to explore the extent to which it affects students' learning engagement. It is of great significance to improve the quality of teacher cultivation in higher education by targeted improvements in the methods of learning Pedagogical Skills by pre-service physical education teachers and higher education teaching and management. This study quantitatively and qualitatively analyzes the current situation and influencing factors of the investment in learning Pedagogical Skills by pre-service physical education teachers through questionnaire surveys, interviews, and data mining. By analyzing the measures to enhance the investment in learning Pedagogical Skills by pre-service physical education teachers and the existing problems and reasons, a training plan for enhancing the Pedagogical Skills of pre-service physical education teachers is proposed.

Keywords: Pre-service Physical Education Teachers; Investment in Learning Pedagogical Skills; Influencing Factors; Training Plan Implementation.

1. Introduction

Teacher education is a key component of the national century-long plan and education plan, which requires continuous improvement in the quality of teacher training. In recent years, the government has issued multiple policy documents emphasizing the training of teachers' Pedagogical Skills and enhancing the quality of teacher education and training. Chinese Pre-Service Physical Education Teachers Engagement in Learning Pedagogical Skills: Input to a Development Training Program. In 2018, it was clearly pointed out in the "Opinions on the Implementation of the Excellent Teacher Training Plan 2.0" issued by the Ministry of Education, the "Suggestions on Comprehensively Deepening the reform of the Construction of Teachers in the New Era" issued by the Central Committee of the Communist Party of China and The State Council, and the "Action Plan for the Revitalization of Teacher Education (2018-2022)" jointly issued by the Ministry of Education and other departments. It is necessary to strengthen the training of teachers' Pedagogical Skills and improve the quality of teacher education. In 2022, the Ministry of Education and other eight departments jointly issued the "New Era Basic Education Strong Teacher Plan", the aim is to address the underlying contradictions in teacher workforce development, establish a comprehensive and integrated policy system for teacher workforce development, systematically enhance the teaching and nurturing abilities of teachers in China, and comprehensively promote the construction of a high-quality teacher workforce. With the continuous evolution of

educational philosophies and changes in the educational environment, teacher education reform needs to focus on the level of investment in learning Pedagogical Skills by teachers.

The level of investment in learning Pedagogical Skills is an important indicator of whether teachers can actively and thoroughly learn Pedagogical Skills. It is of significant importance for improving the quality of teacher education and constructing a high-quality, professional teacher workforce. Therefore, effective measures need to be taken to strengthen the training of teachers' Pedagogical Skills and enhance their level of investment in learning Pedagogical Skills, in order to meet the educational demands of the new era.

2. Survey Participants and Methods

2.1. Survey Participants

The study focused on students and teachers in the physical education teaching programs of three schools in Shanxi province. A total of 210 survey questionnaires were randomly distributed to students, and 110 questionnaires were randomly distributed to teachers. Invalid questionnaires were removed, resulting in 200 valid student questionnaires and 100 valid teacher questionnaires being collected. The surveyed students were selected from senior students who had already completed their internships as prospective physical education teachers. This selection was based on their internship experience and four years of university study, which were considered conducive to obtaining accurate survey results. The surveyed teachers were selected from physical education instructors at universities and colleges. Please refer to Table 1.

Table 1. Number of Respondents per College

Category	Respondents for Questionnaire (students)	Respondents for Questionnaire (teachers)	Respondents for Interview (students)	Respondents for Interview (teachers)
CollegeA	80	36	2	2
CollegeB	60	38	2	1
CollegeC	60	36	1	2
TOTAL	200	100	5	5

2.2. Research Methodology

Based on an extensive review of literature, and considering the characteristics of pre-service physical education teacher's learning of Pedagogical Skills, the author employed a method of extracting items from established questionnaires on learning engagement in Pedagogical Skills from both domestic and international sources. The author then developed a self-designed questionnaire titled "Pre-Service Physical Education Teachers' Learning Engagement in Pedagogical Skills Questionnaire". This questionnaire measures three aspects of learning engagement: cognitive engagement, affective engagement, and behavioral engagement, as well as five factors influencing engagement:

learning motivation, self-efficacy, peer relationships, teaching methods, and curriculum. The Likert four-point scale was used for the questionnaire, where scores ranging from 1 to 4 represented "completely non-compliant" to "completely compliant". Higher scores indicate higher levels of engagement or influence. The author utilized software such as SPSS to process and analyze the survey data.

3. Survey Results and Analysis

3.1. Overall Analysis of Engagement in Pre-service Physical Education Teachers' Pedagogical Skills Learning

Table 2. Pedagogical Skill Learning Engagement

Indicators	Students			Teachers			Overall		
	M	SD	VI	M	SD	VI	M	SD	VI
Cognitive Engagement	3.49	0.606	G E	3.27	0.624	G E	3.42	0.619	G E
Affectiv Engagement	3.52	0.581	G E	3.41	0.570	G E	3.49	0.579	G E
Behavioral Engagement	3.46	0.617	G E	3.25	0.632	G E	3.39	0.629	G E
Overall Average Weighted Mean	3.49	0.576	G E	3.32	0.600	G E	3.43	0.618	G E

Legend: 3.25 – 4.00 Great Extent; 2.50 – 3.24 High Extent; 1.75 – 2.49 Some Extent; 1.00 – 1.74 No Extent.

Table 2 presents the respondents' assessment of the engagement in pre-service physical education teachers' Pedagogical Skills learning. Overall, students showed a high level of engagement in Pedagogical Skills learning, with a mean score of 3.49 and a standard deviation of 0.576. Similarly, teachers reported a mean score of 3.32 with a standard deviation of 0.600, indicating that teachers perceive a high level of engagement in pre-service physical education teachers' Pedagogical Skills learning. As shown in the table, among the specific indicators, both teachers and students rated the dimension of affective engagement in Pedagogical Skills learning with the highest average scores. The students' mean score was 3.52 with a standard deviation of 0.706, while the teachers' mean score was 3.41 with a standard deviation of 0.570. This indicates that both teachers and students believe that pre-service physical education teachers demonstrate a high level of emotional engagement in Pedagogical Skills. Similar trends were observed for the dimension with the lowest average scores, behavioral engagement. The students' mean score was 3.46 with a standard deviation of 0.617, whereas the teachers' mean score was 3.25 with a standard deviation of 0.632. Overall, the mean score for the engagement in pre-service physical education teachers' Pedagogical Skills learning was 3.43 with a standard deviation of 0.609, suggesting a high level of engagement.

The AEQ questionnaire measures students' emotional experiences during the learning process, and research has shown that positive emotions are positively correlated with learning and academic performance. [1] Some researchers have discussed school engagement, including emotional engagement, and have pointed out that emotional engagement has a positive impact on academic achievement and positive learning attitudes. [2]

3.2. Overall Analysis of Factors Influencing Engagement in Pre-service Physical Education Teachers' Pedagogical Skills Learning

Table 3 displays the assessment of factors influencing engagement in pre-service physical education teachers' Pedagogical Skills learning as reported by the participants. Overall, the impact of factors on students' engagement in Pedagogical Skills learning is considered to be high, with an average score of 3.49 and a standard deviation of 0.556. Similarly, the overall average score for teachers is 3.39, with a standard deviation of 0.526, indicating that teachers believe these factors have a significant influence on students' learning of Pedagogical Skills. As shown in the table, among the specific indicators, the factor of teaching methods for pre-service physical education teachers' learning of Pedagogical Skills received the highest average scores from both teachers

and students. The average score for students is 3.62, with a standard deviation of 0.515, while the average score for teachers is 3.41, with a standard deviation of 0.570. This indicates that both teachers and students agree on the substantial impact of teaching methods on engagement in learning Pedagogical Skills. Similarly, both students and teachers share the same opinion regarding the lowest average score indicator, which is the factor of learning motivation.

The average score for students is 3.46, with a standard deviation of 0.568, while the average score for teachers is 3.31, with a standard deviation of 0.557. Therefore, the overall average score for factors influencing pre-service physical education teachers' learning of Pedagogical Skills is 3.53, with a standard deviation of 0.516, suggesting a significant influence of these factors.

Table 3. Factors Influencing Pedagogical Skill Engagement

Indicators	Students			Teacher			Overall		
	M	SD	VI	M	SD	VI	M	SD	VI
Learning Motivation	3.46	0.568	G E	3.31	0.557	G E	3.41	0.567	G E
Self-efficacy	3.56	0.526	G E	3.36	0.589	G E	3.49	0.555	G E
Peer Relationships	3.58	0.526	G E	3.40	0.586	G E	3.52	0.552	G E
Teacheing Methods	3.62	0.515	G E	3.50	0.494	G E	3.58	0.510	G E
Curriculum	3.51	0.540	G E	3.37	0.564	G E	3.47	0.551	G E
Overall Average Weighted Mean	3.53	0.516	G E	3.39	0.526	G E	3.49	0.556	G E

Legend: 3.25 – 4.00 Great Extent; 2.50 – 3.24 High Extent; 1.75 – 2.49 Some Extent; 1.00 – 1.74 No Extent.

The guidance and supportive teaching behaviors of teachers have a significant impact on students' learning engagement. Positive teaching methods can enhance students' level of involvement in their learning. [3] Good classroom management and excellent teaching strategies contribute to improving students' learning engagement. Effective management creates order and a safe learning environment, while teaching methods that stimulate student interest can

increase their level of participation and engagement. [4]

3.3. A Comparison of Pre-service Physical Education Teachers' Perceived Learning Engagement in Evaluating Pedagogical Skills by Teachers and Students

Table 4. Comparison of the Assessment of the Respondents on the Pre-service Physical Education Teachers' Engagement in Learning Pedagogical Skills

Indicators	Respondents	Mean	SD	t-value	p-value	Interpretation	Decision
Cognitive Engagement	Students	3.49	0.606	2.849	0.005	Significant	Reject Ho
	Teachers	3.27	0.624				
Affective Engagement	Students	3.52	0.581	1.609	0.109	Not Significant	Failed to Reject Ho
	Teachers	3.41	0.570				
Behavioral Engagement	Students	3.46	0.617	2.695	0.008	Significant	Reject Ho
	Teachers	3.25	0.632				
Overall Engagement in Learning Pedagogical Skills	Students	3.49	0.576	2.376	0.018	Significant	Reject Ho

Table 4 presents a comparison of participants' evaluations of pre-service physical education teachers' learning engagement in Pedagogical Skills. The results indicate that, overall, there is a significant difference between students (M = 3.49, SD = 0.576) and teachers (M = 3.32, SD = 0.600) in their overall engagement in learning Pedagogical Skills (t-value = 2.376, p-value = 0.018). Therefore, the null hypothesis, which assumes no significant difference in the evaluation of learning engagement in Pedagogical Skills among the groups, is rejected. However, it is noteworthy that the data shows slightly higher average scores for students compared to teachers, indicating that students are to some extent involved in learning Pedagogical Skills. Additionally, students have higher average scores on all three indicators of learning engagement in Pedagogical Skills compared to teachers. This phenomenon can be attributed to the role of the respondents.

The study found that teachers place more emphasis on

student obedience, while students are more focused on their own engagement and performance, leading to significant differences in the evaluation of learning engagement between teachers and students, which is consistent with the results of this study. [5] Similarly, teachers are more concerned with student academic performance and behavior, while students are more focused on interest and level of involvement, leading to differences in the evaluation of learning engagement between teachers and students. [6]

3.4. A Comparison of Teacher and Student Evaluations of Factors Influencing Pre-service Physical Education Teachers' Learning Engagement in Pedagogical Skills.

Table 5. Comparison of the Assessment of the Respondents to the Factors Affecting the Pre-service Physical Education Teachers' Engagement in Learning Pedagogical Skills

Indicators	Respondents	Mean	SD	t-value	p-value	Interpretation	Decision
Learning Motivation	Students	3.46	0.568	2.099	0.037	Significant	Reject Ho
	Teachers	3.31	0.557				
Self-efficacy	Students	3.56	0.526	2.982	0.003	Significant	Reject Ho
	Teachers	3.36	0.589				
Peer Relationships	Students	3.58	0.526	2.720	0.007	Significant	Reject Ho
	Teachers	3.40	0.586				
Teacher Teaching Method	Students	3.62	0.515	1.843	0.067	Not Significant	Failed to Reject Ho
	Teachers	3.50	0.494				
Curriculum	Students	3.51	0.540	2.176	0.030	Significant	Reject Ho
	Teachers	3.37	0.564				
Overall Factors Affecting the Engagement of Learning Pedagogical Skills	Students	3.53	0.516	2.186	0.030	Significant	Reject Ho
	Teachers	3.39	0.526				

Table 5 presents a comparison of respondents' evaluations of factors influencing the learning engagement of pre-service physical education teachers in Pedagogical Skills. The results indicate that overall, there is a significant difference between students ($M = 3.53$, $SD = 0.516$) and teachers ($M = 3.39$, $SD = 0.526$) in their assessment of the comprehensive factors affecting the learning engagement of pre-service physical education teachers (t -value = 2.186, p -value = 0.030). Therefore, the null hypothesis is rejected, indicating a significant difference among the groups in evaluating the factors influencing the learning of Pedagogical Skills for pre-service physical education teachers. However, it is noteworthy that the data shows that students have higher average scores than teachers, suggesting that this factor has a greater impact on student engagement in learning Pedagogical Skills.

There are differences in the evaluation of learning motivation between teachers and students, as they possess different experiences, roles, and social backgrounds. [7] Teacher evaluations tend to be more objective and authoritative, based on professional knowledge, while student evaluations are more subjective and personalized, reflecting individual understanding and feelings. [8] Teacher evaluations provide accurate feedback and guidance to assist students in improving their learning outcomes, which may contribute to significant differences in evaluations between teachers and students.

3.5. Challenges in the Learning Process of Pre-service Physical Education Teachers

Based on interviews with five teachers and five students, two main challenges were identified:

3.5.1. Insufficient Physical Skills

Inadequate proficiency in sports skills leads to a lack of demonstration and explanation abilities. The level of technical proficiency becomes a challenge, necessitating additional practice by students after class.

3.5.2. Internship Requirements

College students need to possess both physical skills and teaching techniques during internships, which presents a

challenging task for them. This includes mastering technical movements, teaching methods, and classroom organization.

Overall, this paragraph emphasizes the increased challenges that college students face in applying physical education Pedagogical Skills in practice. It requires them to exert more effort and time to overcome these challenges. This also reflects the higher demand for comprehensive qualities and practical abilities in the field of physical education teaching. Students can actively seek more learning opportunities, such as participating in training and observing teaching, to enhance their skills and abilities. In response to these challenges, we propose targeted training programs for pre-service physical education teachers. Teachers lack teaching abilities in actions demonstration, explanation, commands, protection, and assistance in real scenarios. [9] Practical courses in universities lack formalities, resulting in insufficient cultivation of teaching abilities for physical education majors. Differences in guidance teacher's educational concepts and abilities hinder the implementation of practical courses, leading to a lack of practical opportunities and practice courses for students and insufficient teaching abilities. [10]

3.6. Pre-service Physical Education Teacher Pedagogical Skills Enhancement Training Program

According to the survey and research, overall learning engagement of pre-service physical education teachers is high, and it is found that influencing factors have a significant impact on their engagement in learning Pedagogical Skills. In order to enhance the learning engagement of pre-service physical education teachers in Pedagogical Skills, we take certain reinforcement measures, focusing on five influencing factors: learning motivation, self-efficacy, peer relationships, teaching methods, and curriculum.

Table 6 presents a training program for enhancing the learning engagement of pre-service physical education teachers in Pedagogical Skills. The recommended measures include domain, objectives, activity content, budget, key participants, training duration or frequency, and assessment

methods.

Table 6. Pre-service Physical Education Teacher Pedagogical Skills Enhancement Training Program

Key Result Areas (KRAS)	Objectives	Activities	Budget	Person Involved	Training Time or Frequency	Success Indicator
learning motivation	Increasing students' sense of value in learning physical education pedagogical skills.	Lecture 1. Inspire students' sense of value for learning skills through successful cases or practical activities. 2. Allow them to experience the joy and value of learning physical education Pedagogical Skills through practical operations. 3. Provide timely feedback and guidance to students.	6,000RMB	Teachers Students	Regularly conduct training once per semester.	Periodic surveys.
self-efficacy	Training teachers and students on how to enhance students' self-efficacy.	Lecture 1. Set goals for students. 2. Encourage students' efforts and accomplishments by teachers and parents. 3. Provide support to help them overcome difficulties and increase students' confidence. 4. Encourage students' social activities. 5. Allow students to engage in self-evaluation and feedback.	3,000RMB	Teachers Students	Conduct training once for each cohort of students.	Regular survey feedback.
Peer Relationships	Teaching students how to get along harmoniously with others.	campus activity 1. Organize various cooperative games for students. 2. Divide students into groups to discuss and share opinions on specific topics. 3. Organize students to participate in volunteer service and charity activities.	9,000RMB	Students	Organize two to three activities per semester.	Regular survey feedback
Teaching Methods	Teachers employ a variety of teaching methods to enhance students' interest in learning.	1. Professional Training for Teachers 2. Training for Enhancing Pedagogical Skills of Teachers	10,000RMB	Teachers	Organize training periodically with intervals of two to three years.	Evaluation through student feedback.
curriculum	Continuously strengthen students' practical abilities.	Increase the emphasis on practical exercises in Pedagogical Skills learning courses.	2,000RMB	Teachers Students	Add one semester of practical learning courses for each cohort of students.	Regular organization of pedagogical skills practice competitions.
practice	Provide students with internship learning opportunities.	1. Classroom Observation of High-Quality Lessons 2. Observation of High-Quality Lessons 3. Organize Student Field Internships	9,000RMB	Teachers Students	Increase the practical training period by two months for each cohort of students.	1. Organize student assessments and evaluations. 2. Organize practical class excellence activities.

4. Conclusion and Recommendations

4.1. Conclusion

Based on the survey results, the following conclusions can be drawn:

1) In the learning of Pedagogical Skills for pre-service physical education teachers, students demonstrate positive emotional engagement and enthusiasm for the learning content. However, some students exhibit deficiencies in behavior, possibly due to confusion or lack of motivation caused by the difficulty or challenging nature of the learning tasks. Educational institutions and teachers should take measures to enhance students' behavioral engagement, encourage their active participation in learning activities, and provide support and guidance to help them overcome difficulties and challenges.

2) Teachers' teaching methods have a direct and significant impact on students' engagement in learning, and utilizing flexible, diverse, and highly interactive methods can stimulate students' interest and initiative. Although the impact of learning motivation is relatively small, in the learning of Pedagogical Skills for pre-service physical education teachers, students have a relatively high interest in this field and their learning is related to future career goals, hence their motivation for learning is relatively stable. However, it is still important to pay attention to and guide students' learning motivation to ensure their continued engagement in learning and enhance learning effectiveness.

3) Teachers and students have different views and evaluations regarding cognitive and behavioral engagement towards teachers' Pedagogical Skills, reflecting the existence of different perspectives and standards in evaluating the learning of Pedagogical Skills. The reason for this difference lies in the lack of sufficient communication and understanding between teachers and students.

4) There are differences between teachers and students in terms of motivation for learning Pedagogical Skills, self-efficacy, peer relationships, and course arrangements, leading to different emphasis and viewpoints when evaluating the engagement in learning Pedagogical Skills. This difference reflects a certain disconnection between teachers and students in their cognition and evaluation of learning Pedagogical Skills, and requires more communication and understanding to coordinate the perspectives of both parties and promote the effective implementation of learning Pedagogical Skills.

5) How to enhance the behavioral engagement of pre-service physical education teachers in Pedagogical Skills through training is the key training program to improve their Pedagogical Skills.

6) To comprehensively enhance the engagement of pre-service physical education teachers in Pedagogical Skills, it is necessary to strengthen the development of targeted training programs and strictly follow the requirements, continuously improving the Pedagogical Skills of pre-service physical education teachers to meet the needs of teachers in the new era.

4.2. Recommendations

Based on the above conclusions, the following suggestions are proposed:

1) Teach students how to effectively manage their time and create their own study plans, cultivating good study habits and

improving the cognitive engagement of pre-service physical education teachers in Pedagogical Skills.

2) Provide diversified teaching methods during teacher training sessions to enhance teachers' teaching abilities and cultivate their interest in learning Pedagogical Skills.

3) Guide students to develop correct learning values, improve their motivation for learning, enhance their self-efficacy, and cultivate their ability for independent learning, thereby increasing their behavioral engagement.

4) Organize campus activities for students to promote interpersonal communication, foster positive peer relationships, and teach students how to get along harmoniously with others.

5) Increase the proportion of practical courses in Pedagogical Skills, allowing students to enhance their practical teaching abilities.

6) Provide more opportunities for students to engage in field-based practical teaching experiences.

Conflicts of Interest

I declare that the paper "Participation of Pre-service Physical Education Teachers in Teaching Skill Learning: Involvement in Development Training Programs" submitted by me is my independent and original work. It does not contain any previously published content and adheres to the citation norms. The research has taken into consideration the potential risks involved, obtained ethical and safety approvals, respected the rights of the interviewees, and adhered to ethical principles. I have read and complied with the university's "Guidelines for Research Ethics" and am willing to take responsibility for the research process.

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