



**THE INFLUENCING FACTORS OF TEACHER PEDAGOGICAL
ABILITY ENHANCEMENT IN SHANDONG UNIVERSITY OF
ENGINEERING AND VOCATIONAL TECHNOLOGY**

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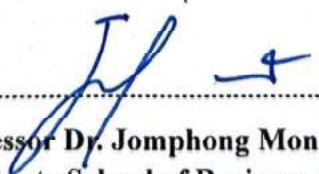
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This Independent Study has been Approved as a Partial Fulfillment of the
Requirement of International Master of Business Administration

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Date: 6 / April / 2024


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ABSTRACT

Shandong University of Engineering and Vocational Technology is experiencing a quality decline due to teachers' poor teaching ability, enthusiasm, and practical abilities. In order to solve this problem, the institution is forming an innovation team to promote educational reform and development. This paper aimed to study the influencing factors of teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

The objectives of the study were: 1) To explore whether the social security system affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology; 2) To explore whether teacher training affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology; 3) To explore whether willingness to learn affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology; 4) To explore whether teacher management affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

This study adopted the quantitative research method. In this study, a total of 378 questionnaires were distributed, with 303 valid questionnaires and the validity rate was 80.16%. The population was the instructors of Shandong University of Engineering and Vocational Technology. Based on the teacher professional development theory, this paper found that: 1) Social security system has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology; 2) Teacher training has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology; 3) Willingness to learn has a significant positive effect on teacher pedagogical ability

enhancement in Shandong University of Engineering and Vocational Technology; 4)Teacher management has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. For recommendations, teacher pedagogical ability enhancement should focus on the follow aspects: 1) Improving the social security system; 2) Optimizing teacher training; 3) Raising willingness to learn; 4) Transforming teacher management.

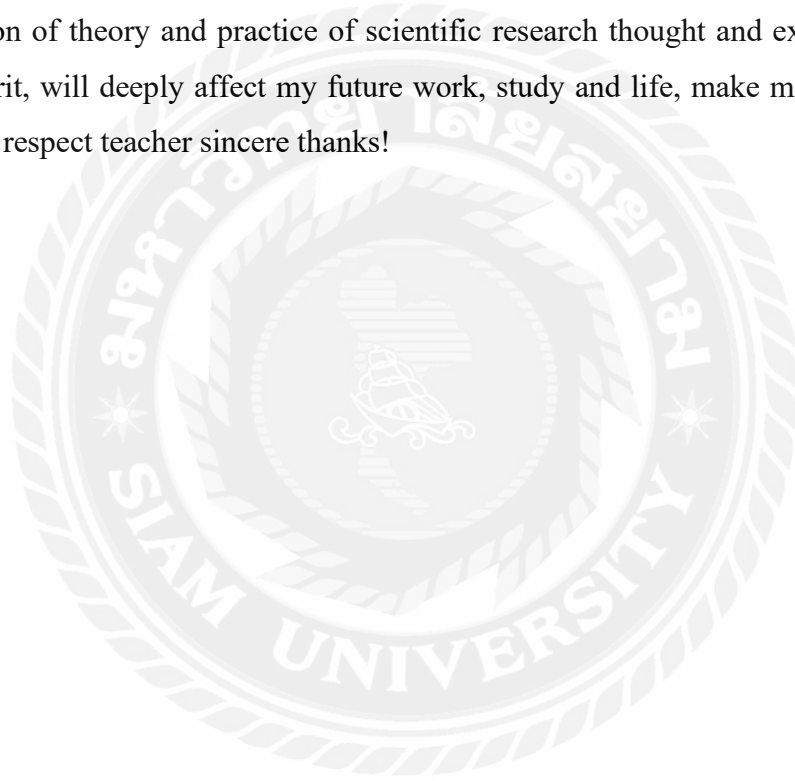
Keywords: influencing factors, teacher pedagogical ability, private higher vocational universities



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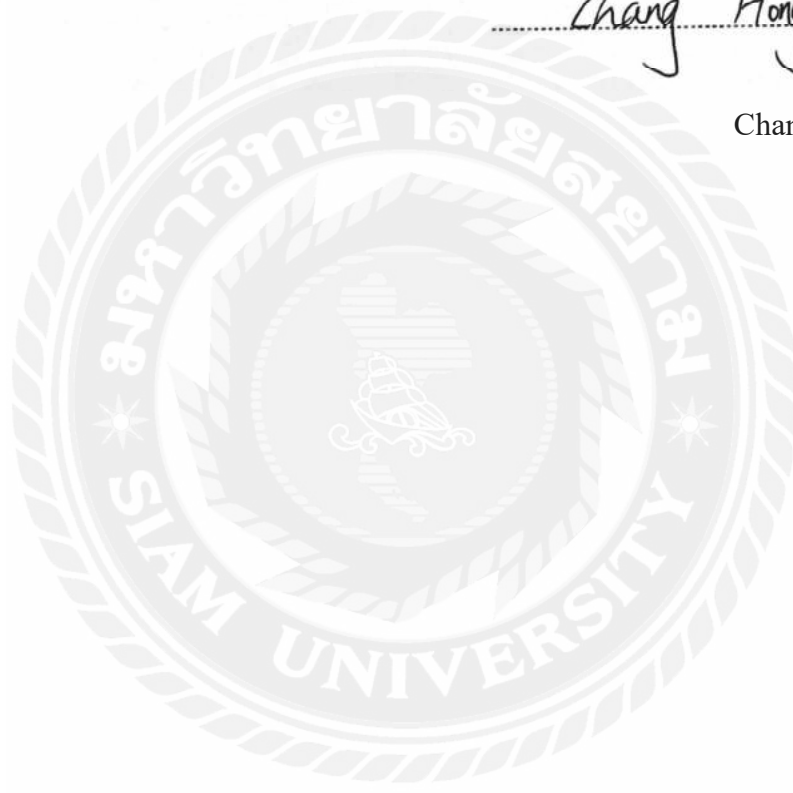


DECLARATION

I, Chang Hongzhou, hereby certify that the work embodied in this independent study entitled “The Influencing Factors of Teacher Pedagogical Ability Enhancement in Shandong University of Engineering and Vocational Technology” result of original research and has not been submitted for a higher degree to any other university or institution.

Chang Hongzhou

Chang Hongzhou
Feb 1, 2024



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Chapter 1 Introduction

1.1 Background of the Study

At present, with the increasing demand for talents in the society, the requirements of enterprise units for the quality of talents are getting higher and higher. Cultivating practical talents with good professional moral quality, professional practice ability, reform and innovation ability has become the mission and task given to educators by the society in the new era. The quality of talent cultivation is inseparable from the quality of teachers' teaching, therefore, in order to cultivate a technical talent that can be used by the society, it is imperative to comprehensively enhance the educational quality of vocational school teachers and improve the teaching ability of vocational school teachers (Zhu, 2021).

Today's society is developing rapidly, and the comprehensive national strength is steadily increasing. In the context of the rapid development of the market economy, China's education is also developing rapidly, gradually becoming an important part of the education field, and receiving extra attention from individuals. Nowadays, high and new technology has entered the production field (Long et al., 2019), such as the rapid development of new energy industry, which makes the country's demand for skilled personnel increase, and more and more low-skilled and low-capacity workers are replaced by senior professional and technical personnel with higher technology and quality. The production, construction, management and service concepts of factories and enterprises in the whole society have undergone a great transformation, and there are stricter standards for the quality of production on the front line. This series of changes foretells that the society will put forward higher conditions for the cultivation of talents in institutions, which will lead to the upgrading and upgrading of the construction of high-level teacher teams in institutions and at the same time put forward brand-new requirements for the teaching ability of teachers (Zeng et al., 2019).

Competition also exists among schools. If any school wants to seek survival and development, the quality of education is the link that must be ensured. Teachers are the key factor in determining the quality of education, so the construction of high-quality teachers has become a key task in the development of teachers in various schools. Have to admit that at present China's institutions of higher learning teacher team building is still the weak link in the whole education system, especially private universities teacher team building there is still a long way to go (Zhiyong, 2020). Teachers teaching ability is weak teachers learning motivation is insufficient as well as practice ability is not strong is the outstanding problem in the current education. At present, the construction of a number of education teachers teaching innovation team, to promote the "dual-teacher" teacher team construction is the specific requirements of China's education reform and development, teaching ability has become a key concern of education administrators (Roddy et al., 2017).

Some aspects of the lack of teaching ability of teachers in Shandong University of Engineering and Vocational Technology may include lack of teaching experience, insufficient level of professional knowledge, insufficient flexibility in teaching methods, and insufficient scientific research ability. Shandong University of Engineering and Vocational Technology needs to cope with educational challenges, improve the quality of teaching, train students for the future, enhance the competitiveness of the university, and adapt to educational reforms. Only through the continuous improvement of teachers' ability can it better meet the social demand for education, improve the overall strength of the school, cultivate competitive students and promote the continuous development of education. Quality teachers can provide students with better education and guidance, cultivate their professional skills and comprehensive ability, and promote the growth and development of students. Therefore, it is of great significance to study the influencing factors on the improvement of teachers' ability in Shandong University of Engineering and Vocational Technology.

1.2 Questions of the Study

Teacher competence is not a single type of competence, but a combination of competences that together form the unique professional competence of teachers. When a teacher's competence cannot be perfected, the structure of the teacher's professional competence will be seriously affected. If this phenomenon is not properly solved, teachers will not be able to adapt to the new requirements for the teaching force in the new reform period, which will not be conducive to the construction of the teaching force and the overall development of individual teachers. Although schools have provided opportunities for teachers to improve and develop their professional abilities, and have made relevant regulations on the number of teachers can participate in training, the failure to make systematic evaluations of teachers' training has not caused some teachers to pay attention to themselves in participating in training, resulting in a weak sense of participation among teachers. Systematic training for teachers can improve and develop their professional ability, which is in line with the requirements of the new era of teacher team building (Richards, 2011).

Schools should start from the actual situation of teachers, make full use of their own resources, mobilize all positive factors, and give full play to the potential of the school. In addition to providing teachers with the necessary hardware facilities, a good reading environment and the right to conduct scientific research on their own, schools should also take the initiative to enhance exchanges between schools, hire education experts or backbone teachers to provide guidance and assistance for the development of teachers in their own schools, and provide theoretical support for the development of teachers' vocational ability. However, the motivation to improve teachers' professional competence in actual education and teaching work is always neglected, and the desire to improve the status quo of professional competence is not strong. Due to the special nature of the teaching profession and the social responsibility it bears, the

teaching group has always been regarded as one of the largest groups that promote the development of society (Alimmudin, 2022). However, the motivation to improve teachers' professional competence is often in a state of absence. Therefore, this study proposes a research on the factors influencing the improvement of teachers' competence.

(1) Does the social security system affect teacher ability enhancement in Shandong University of Engineering and Vocational Technology?

(2) Does teacher training affect teacher ability enhancement in Shandong University of Engineering and Vocational Technology?

(3) Does willingness to learn affect teacher ability enhancement in Shandong University of Engineering and Vocational Technology?

(4) Does teacher management affect teacher ability enhancement in Shandong University of Engineering and Vocational Technology?

1.3 Objectives of the Study

The enhancement and development of teachers' professional competence is a gradual process, which is not a single level of education but a dynamic process in line with the social, economic, scientific and technological aspects of a country, and is characterized by its comprehensiveness, systematicity and development. There are many factors affecting the improvement and development of teachers' professional competence, including external factors from society and schools, as well as internal factors from individual teachers. The following analyzes the improvement and development of teachers' professional competence from the factors of school environment, education administration and management, teachers' professionalism, and teachers' psychology. Improving the level of teachers' professional competence and promoting teachers' professional development is a common goal of all school education and a necessary path for the growth of the general teaching force. The increasing advancement of the curriculum reform process has put forward higher requirements for the majority of teachers (Hachfeld et al., 2015). On the one hand, teachers should learn the most cutting-edge theories of education and teaching, improve their comprehensive quality, constantly grasp the opportunity to keep abreast of the times, take the initiative to participate in their own development, and strive to be excellent new teachers; on the other hand, education administration and schools should provide more and better platforms for the improvement and development of teachers' professional competence. The study of factors influencing the improvement of teachers' competence can provide suggestions for the improvement of teachers' competence. Therefore, combined with the above analysis, the objectives of this study were:

(1) To explore whether the social security system affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

(2) To explore whether teacher training affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

(3) To explore whether willingness to learn affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

(4) To explore whether teacher management affects teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

1.4 Scope of the Study

The scope of this study is Shandong University of Engineering and Vocational Technology. Other schools are not included in the scope of the study. The research subjects are the teachers of Shandong University of Engineering and Vocational Technology. The interviewed teachers need to work in Shandong University of Engineering and Vocational Technology. Have some evaluation of their own teaching ability. At the same time, they can give some comments on the school's teaching work. The study period is from October 30, 2023 to January 30, 2024. A questionnaire was used to collect information during the study. The questionnaire contained two main sections. The first section is the basic information about the survey sample. The second section mainly deals with the social security system, teacher training, willingness to learn, teacher management, and so on.

1.5 Significance of the Study

This study contributes to the refinement of the basic theory of the development of teachers' pedagogical competence. Teachers' teaching competence is a core component of teachers' professional development and is necessary for schools to remain competitive. Existing research on teaching competence is relatively rich, but still imperfect. Studying the current situation, needs and cultivation countermeasures of teachers' teaching ability is conducive to understanding the development characteristics of teachers' teaching ability and enriching the theory of teachers' professional development (Frenk et al., 2020).

This study helps optimize the mechanism of teacher training. Carrying out research related to teachers' teaching ability is especially important for educational administrators to explore the way of cultivating teachers' teaching ability and to optimize and upgrade the existing management mode and cultivation mechanism. In this study, while researching the teaching ability of teachers, the study maps the training

and training situation of teachers in schools, analyzes the reasons for the insufficiency of teaching ability and the problems in the training, and then optimizes and improves the cultivation and training system of teaching ability (Phillips McDougall et al., 2019).

In the face of the new orientation of education reform, new journey and new mission, the study of school teachers' teaching ability and cultivation countermeasures is of great significance to deepen the education reform through the concrete practice of national policies. Specifically, on the one hand, the research on the status quo of teachers' teaching ability provides a basis for improving the teaching quality of Shandong University of Engineering and Vocational Technology. On the other hand, school administrators can refer to the findings of the study to understand the lack of teaching ability of teachers engaged in teaching, targeted teacher training, so as to scientifically carry out the management of teachers of Shandong University of Vocational Engineering and Technology, and further promote the construction and development of the teaching force. At the same time, the results of the research on teachers' teaching ability development can provide reference and help teachers to determine their own career development (Frenk et al., 2020; Phillips McDougall et al., 2019) t. Teachers can clarify the development direction while discovering the deficiencies of their own ability development in order to obtain sustainable development.

1.6 Conceptual and Operational Definition

Social security system: Research may include investigation and analysis of the social security policies, systems and measures to understand their impact on teachers' career development, work motivation and level of the social security. Operation may involve collecting and analyzing relevant policy documents, statistical data, questionnaires, etc., in order to assess the soundness, coverage and impact of the social security system.

Teacher training: The study may explore the content, form and effect of teacher training as well as its relationship with the enhancement of teachers' competence. Operations include collecting information on teacher training courses, implementing teacher training programs, and conducting training effectiveness evaluations, in order to understand the role of teacher training in enhancing teacher capacity and improving teaching quality.

Willingness to learn: The study can investigate and analyze teachers' willingness and need to learn, and explore the relationship between them and factors such as teacher training and professional development. Operations may include designing and implementing questionnaires, individual interviews, focus group discussions, etc., in order to understand teachers' willingness, motivation and needs to learn.

Teacher management: The study may focus on teacher management systems, policies, practices, and the ways and effects of administrators' management of teachers. Operations include collecting documents and information related to teacher management, conducting questionnaire surveys, in-depth interviews, etc., in order to understand the current situation of teacher management, its problems and effects on teacher competence.

Teacher ability: the study can assess the level of teachers' competence in terms of professional knowledge, teaching skills, research ability, and comprehensive quality. Operations may include designing and implementing teacher competency assessment tools, conducting observational assessments, student achievement analysis, teaching feedback surveys, etc., in order to assess the level of teacher competency and the path to improvement.



Chapter 2 Literature Review

2.1 Literature Review

2.1.1 Teacher Pedagogical Ability

Competence is a psychological trait, which is a condition for the use and mastery of knowledge, and is characterized by individual variability. It is a psychological trait that has a direct impact on the results and efficiency of a person in accomplishing an activity. Competence must be carried by specific activities, through which a person's competence and the potential development of competence can be demonstrated. Competence has a wide range of activities to apply the ability, special activities to use the ability (Huda, 2019). These two types of abilities are used to acquire easy knowledge, and one is used to play a special role. Individuals also tend to combine these two kinds of abilities and apply them to practical activities in order to accomplish them successfully, especially complex ones.

From the point of view of competence, "teacher's professional competence" is first of all a kind of competence, which is a kind of psychological characteristic possessed by the group of teachers and applied to the practical activities of education and teaching; there are many kinds of competence, so "teacher's professional competence" is also a combination of many kinds of competence. To summarize, "teacher's professional competence" is a psychological characteristic of teachers that is applied to the scope of education and teaching to accomplish a certain activity smoothly and effectively. Teacher professional competence is the ability to develop all the abilities needed for teaching and learning activities, which are formed and developed during the process of education and teaching practice. Teachers' professional competence is an optimized combination of various abilities, which is a key factor in determining the quality of education and an important aspect of teachers' career development (Susanto et al., 2019).

Teachers' teaching ability is different from teaching skills, teaching skills refer to the teacher's use of existing theoretical knowledge of teaching, through practice and the formation of a solid, complex teaching behavior system. Teaching ability, on the other hand, is the structural sum of teachers' subject teaching ability, general teaching ability and teaching cognitive ability, and is the core part of teachers' professional ability. Specifically, teachers' pedagogical competence includes four aspects: awareness, design, dissemination, organization and interaction. Cognitive ability is mainly manifested in good memory, rich imagination, keen observation, thinking ability and creative ability; design ability mainly refers to the ability of teaching design, including the formulation of teaching objectives, analysis of teaching materials, teaching implementation strategies and teaching evaluation ability; dissemination ability includes the teacher's verbal expression ability, physical expression ability, written

expression ability, and the ability to reasonably use modern educational technology; organizational ability mainly refers to the ability of teaching design, including the formulation of teaching objectives, analysis of teaching materials, teaching implementation strategies and teaching evaluation ability; organizational ability mainly includes the ability of teachers' language, physical expression ability, written expression ability and reasonable use of modern educational technology. Organizational ability is mainly reflected in the teacher's teaching organization, including classroom organization, extracurricular activities, the ability to organize and cultivate excellent collective ability and coordination ability. Interaction ability mainly refers to the teacher's ability to interact with students, parents, and colleagues in the three major interpersonal relationships (Ferri et al., 2020).

Teachers must have certain interpersonal skills if they want to carry out their work smoothly and realize the goal of educating people. Teachers need to establish equal and harmonious teacher-student relationships with students, establish a relationship of trust with parents, and establish a collaborative relationship with colleagues, so as to ensure the normal development of teaching and learning, and achieve good teaching results in the daily teaching process, good teaching skills can help teachers make corresponding adjustments to teaching activities based on the existing level of knowledge or learning experience; take on the role of instructional designer, and make appropriate adjustments to the teaching and learning environment. Learners, related participants, and the teaching environment to analyze; to be able to predict the changes that may occur in the teaching situation, and can adjust the teaching to adapt to these changes; to clarify the teaching objectives, the development of teaching resources, teaching assessment and other work (Ferri et al., 2020; Phillips McDougall et al., 2019).

2.1.2 Teacher Professional Development Theory

(1) Definition of Teacher Professional Development Theory

The teaching profession is one of the oldest professions in human society, and the world's earliest teacher education appeared in France, where the teaching profession gradually became professionalized and institutionalized. As early as the 1960s and 1970s, UNESCO and the International Labor Organization (ILO) defined the professionalism of the teaching profession as an occupation that requires continuous and rigorous learning to maintain its specialized knowledge and skills. Teacher professional development is increasingly becoming the direction of teacher professionalization, and countries around the world are actively taking measures to promote teacher professional development (Svendsen, 2016). Education has become an important means of promoting the national economy, and in order to ensure the country's strategic position and the quality of education, unprecedentedly high demands have been placed on contemporary teachers. Therefore, how to improve the level of teachers and maximize their professional development has become an important

proposition in the reform of contemporary teacher education (Soine & Lumpe, 2014).

Teachers' professional development is different from "teachers' professionalization", which is defined from the dimension of pedagogy and refers to teachers' inner individual professional improvement. Teacher professional development is the process of teachers' professional growth. This "process theory" ignores the ways and reasons of teachers' professional development, and fails to comprehensively reflect the whole process of teachers' development. Teachers' professional development is the process of promoting teachers' professional growth (Marsh & Mitchell, 2014). This "action theory" lacks attention to the improvement of teachers' own knowledge and ability in their professional development, and therefore cannot fully reflect the process of teachers' professional development. Teachers' professional development is a combination of the state of teachers' professional growth and the actions that promote the process of professional growth, thus reflecting the process of teachers' professional growth in a comprehensive way. The characteristics of teacher professional development reflect the idea of "people-oriented", with five aspects: autonomy, stage, lifelong, contextual and richness. Teachers' professional development helps to optimize teachers' quality, promote teachers' professional maturity, enhance teachers' status and promote social progress (Brodie, 2019).

Teachers' professional development theory divides teachers' career cycle into different stages, among which some representative ones, such as the "Stages of Concern Theory", divide the process of teachers' growth into four stages: pre-service concern, early concern for survival, concern for the teaching situation, and concern for the students. The "career stage theory" divides teachers' professional development into three stages according to their biological age. The "Teacher Career Development Cycle Model" divides the teaching profession into eight stages. According to the characteristics of each stage of the teacher's career, the teacher's career cycle is generally divided into: the preparation period before joining the profession, the adaptation period at the beginning of teaching, the period of stable development, the period of stagnation and the period of sustained development, in which the development of the teacher's professional career is affected by a variety of factors, from the point of view of the external influences of governmental laws and regulations and policies, the continuing education system, and the atmosphere of public trust, the school's management style, the system and the organizational atmosphere. In terms of external influences, there are government regulations and policies, continuing education system and public trust atmosphere, school management style, system and organizational atmosphere, and from the teachers themselves, their own motivation for career development, career planning ability, and self-evaluation ability also influence their professional development (Bishop & Berryman, 2010).

(2) Social Security System

The social security system plays an important role in the theory of teacher professional development, and it affects teachers' ability to teach. The social security system provides a certain degree of professional stability, including job stability and guaranteed pay packages. In a stable working environment, teachers are more likely to be engaged in teaching and less likely to be distracted by the fear of job instability, which enhances teaching effectiveness. The social security system covers social benefits for teachers, such as medical insurance, pension insurance and housing provident fund (Demsetz & Lehn, 2023). These benefits safeguard teachers' basic living needs and reduce their life pressure, so that they are abler to concentrate on their teaching work and feel a sense of security psychologically, which is conducive to improving teaching motivation and efficiency. The social security system has a positive impact on teachers' career development. For example, it provides a system of vocational training and promotion opportunities, which stimulates the motivation of teachers' career development and prompts them to continuously improve their teaching level and professionalism, and then improve their teaching ability. A good social security system can increase the overall satisfaction of teachers, giving them a higher sense of identity and responsibility for their educational endeavors. Increased teacher satisfaction helps to reduce teacher turnover and maintain the stability of the teaching force, thus ensuring the stability and improvement of the quality of education (Friedman & Savage, 2020). The social security system has a positive impact on teachers' ability to teach by providing career stability, social benefits, opportunities for professional development, and increased teacher satisfaction, helping to improve teachers' professionalism and quality of teaching.

(3) Teacher Training

Teacher training plays a crucial role in the theory of teacher professional development. Teacher training provides learning opportunities for professional knowledge and teaching skills, helping teachers to master the latest teaching theories, methods and techniques. Through systematic training programs, teachers can learn effective teaching strategies, classroom management skills and so on, thus enhancing their teaching ability. Teacher training helps to update the concept of education and leads teachers to recognize the changes in educational philosophy and the updating of teaching models. The theoretical seminars and case studies in the training courses can stimulate teachers' thinking, prompt them to think about the core issues of education and teaching, and improve the relevance and effectiveness of teaching. Through participation in training, teachers can have a clearer understanding of their own professional development needs and directions (Mary & Takashi, 2019), and receive relevant support and guidance. Training courses usually cover personal growth planning and career development paths, which help teachers build up a positive sense of professional development, and then continuously improve their teaching ability. Through training, teachers can gain recognition for their professional knowledge and

skills and increase their confidence in teaching. Equipped with sufficient knowledge reserves and practical experience, teachers are more confident in dealing with teaching challenges and more actively engaged in teaching practice, thus improving teaching effectiveness. Teacher training has a positive impact on teachers' teaching ability by enhancing teaching skills, updating educational concepts, increasing awareness of professional development and boosting teachers' self-confidence, which helps to improve the quality of education and teaching and the development of education (Kodron, 1993).

(4) Willingness to Learn

In the theory of teacher professional development, the impact of willingness to learn on teachers' teaching ability is crucial. A strong willingness to learn can stimulate teachers' desire for self-growth and professional development, prompting them to actively participate in all kinds of educational training and learning activities. Through continuous learning and accumulation of knowledge, teachers are able to continuously improve their professional level, so that they can better cope with various challenges in teaching and improve their teaching ability (Yaşar et al., 2006). Teachers with a strong willingness to learn are more willing to take the initiative to accept new educational concepts and teaching methods, and are willing to constantly reflect on and adjust their teaching practices. By participating in various professional training and learning activities, teachers are able to learn about the latest educational theories and practices, so that they can update their educational concepts and teaching philosophies in time and improve their teaching abilities. A strong willingness to learn enhances teachers' sense of teaching efficacy, i.e., their confidence and belief in their ability to successfully accomplish their teaching tasks. Through continuous learning and accumulation of experience, teachers can improve their self-confidence in teaching and become more actively involved in teaching practice, thus improving their teaching ability. Teachers with a strong willingness to learn are more willing to take the initiative to participate in teacher professional communities and learning teams, and to interact and share their teaching experiences with other teachers. By interacting and collaborating with other teachers, teachers are able to gain more teaching inspiration and support, thus further improving their teaching ability. Therefore, willingness to learn, as an important factor in the theory of teachers' professional development, plays an important role in the improvement of teachers' teaching ability, which can promote teachers' continuous learning and growth and improve their teaching level and professionalism. (Brown et al., 2019)

(5) Teacher Management

In teacher professional development theory, the impact of teacher management on teachers' ability to teach is multifaceted. The leadership style and motivational approach of teacher managers have a direct impact on teachers' motivation and teaching incentives. Positive and motivational leadership styles can stimulate teachers' work

enthusiasm and enhance their teaching motivation, thus improving teaching effectiveness (Chen, 2020). The allocation of resources by teacher administrators determines the advantages and disadvantages of teaching conditions and environments. Reasonable allocation of resources can provide teachers with good teaching conditions and support so that they can better carry out their teaching work and improve their teaching ability. Instructional guidance and support provided by teacher administrators have an important role to play in promoting teachers' teaching ability. By providing professional instructional guidance, feedback, and support, teachers are helped to continually improve and refine their teaching practices and raise their teaching standards. Teacher administrators are able to provide teachers with various types of professional development opportunities, including trainings, workshops, and networking events (Supovitz, 2017). These opportunities help teachers to continually improve their professionalism and teaching ability, and promote the continuous improvement of teaching quality. Teacher managers motivate teachers to actively participate in teaching activities through performance assessment and incentive mechanisms, and evaluate and reward their teaching achievements and performance. Reasonable performance evaluation and incentive mechanism can stimulate teachers' work motivation and improve their teaching ability. Therefore, the impact of teacher management on teachers' teaching ability in the theory of teacher professional development is all-encompassing, and it promotes teachers to continuously improve their own teaching ability through the roles of leadership incentives, resource allocation, teaching guidance and support, professional development opportunities as well as performance evaluation and incentive mechanisms, thus promoting the continuous improvement of education and teaching quality.

2.2 Research Relevant

Scholars in different fields have different understandings of the content, characteristics and task functions of teachers' professional competence, and analyze the factors affecting teachers' professional competence from different perspectives. As for the analysis of the connotation of teachers' professional competence, scholars pay more attention to its holistic nature and analyze the different factors that constitute the structure of teachers' professional competence on this basis.

(1) Research on the Connotation of Teachers' Professional Competence

Competence is a concept with relatively wide extension and rich connotation. In terms of its constituent elements, vocational competence includes relevant knowledge, skills, behavioral attitudes and vocational experience, etc.; in terms of the content involved, it is divided into three components: professional competence, methodological competence and social competence. Teachers' professional competence generally refers to the professional competence acquired by teachers in the career activities they are engaged in, which has the characteristics of practicalization and personal experience

(Kim Min Jeong, 2017). In the research related to teachers' professional competence, scholars believe that future teachers must have the following kinds of competence, including: concrete feeling ability, thinking and observing ability, abstract generalization ability, and active practice ability. Teachers should have teaching ability, extracurricular participation ability, classroom management ability, administrative skills and professional development ability. Teachers are expected to have: pedagogical, creative, intellectual, expressive, communicative, and organizational skills. The teaching profession requires teachers to have nine competencies: the ability to understand students, the ability to teach material in an understandable way, the ability to persuade others, the ability to organize, the ability to manage teaching and learning, the ability to work creatively, the ability to react quickly to educational situations and to maintain a flexible demeanor in them, the ability to be competent in the subject matter to be taught, the ability to arouse the interest of students, or the ability to test teachers in a certain area. The structure of competencies of the teaching profession should be the sum of a set of competencies based on epistemology and expressed in specific educational and teaching activities. Because competence is not some single characteristic, but the sum of multiple psychological characteristics with a complex structure. Teachers' teaching, scientific research, management and innovation ability should become an important part of the teacher's professional ability, the structure of the system is established whole and unified, but also relatively independent and interplay (Rajagukguk, 2017).

(2) Research on Factors Affecting the Development of Teachers' Vocational Competence

Experts analyze the internal and external environments of teachers' career as the main factors affecting the improvement of teachers' professional competence. Researchers have categorized the stages of teachers' career according to different criteria and studied the characteristics and needs of teachers at each stage. According to the natural aging process and cycle of life (Sánchez-Prieto et al., 2021), the teacher career life cycle is divided into eight stages, and two major categories of influencing factors are also summarized: first, personal environmental factors. These include family factors, positive key events, life crises, personal temperament, interests and hobbies, and life stage; the second is organizational environmental factors. These include school rules and regulations, management style, public trust, social expectations, professional organizations, and teacher associations. There are three main factors in teacher development (Radkevych et al., 2021). First, personal factors. These include cognitive development, career development, and motivational development; the second is factors related to teachers' work life. These include society and community, the school system, the school, the teaching team or faculty, and the classroom; and special interventions that promote teacher development.

Lifelong education, as promoted by the United Nations, is important not only for the general public, but also for knowledgeable teachers (Tacconi et al., 2021). Different

countries and regions have different requirements for teachers' professional competence, and the ways to improve and develop teachers' professional competence are also different. In Australia, the development of teachers' professional competence is mainly realized through mutual observation, mutual evaluation and reflection on practice, with more emphasis on teachers' teaching practice, cooperation with others, instructional design and public relations. In the United States, the development of teachers' professional competence is in a relatively mature stage in the world, and its teachers' professional competence is based on teachers' self-constructed teacher knowledge, social cognitive learning theory and adult learning theory, and in this way derives from the development of teachers' professional competence in the way of network learning, teachers' research, teachers' study groups and other teachers' professional competence. The high quality of German primary and secondary school teachers is recognized around the world, and the three stages of learning (Kim Min Jeong, 2017; Rajagukguk, 2017; Tacconi et al., 2021), reflection and behavioral change are combined through clear goals for further training as a way of enhancing and developing teachers' professional competence.

2.3 Conceptual Framework

According to the literature review, the influencing factors for the improvement of teachers' teaching ability are multifaceted. By analyzing the theory of teachers' professional development, it is proposed that social security system, teacher training, willingness to learn, teacher management are the influencing factors of teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. The model framework is shown in Figure 2.2

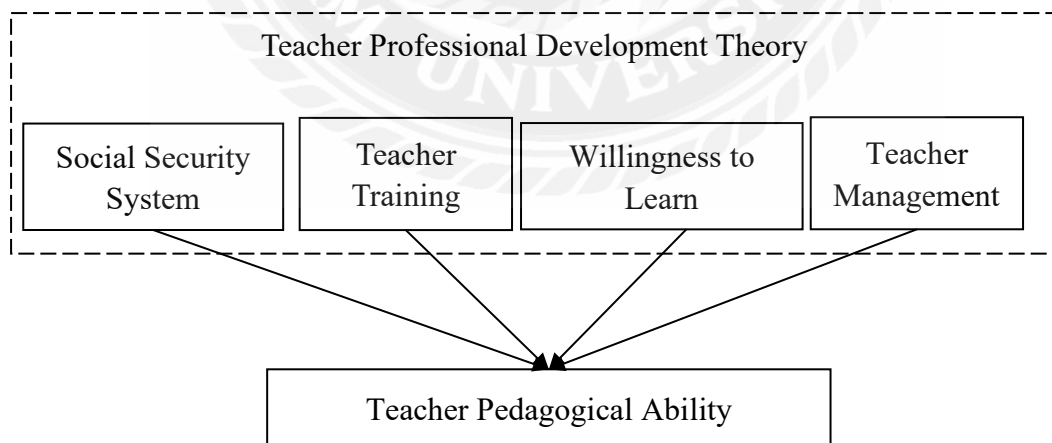


Figure 2.2 Conceptual Framework

Chapter 3 Research Methodology

3.1 Introduction

The main research of this study is about the factors influencing the improvement of teaching ability of teachers in Shandong University of Engineering and Vocational Technology. Research variables such as social security system, teacher training, willingness to learn, teacher management are proposed in the research process. Measurement questionnaires for each variable were designed based on the classical scales of the research literature. The reliability and validity of each variable was measured and correlation analysis can only be done if it passes the reliability test and validity test. This study is based on teacher self-assessment questionnaire. The first part is the basic information about the individual teacher, which includes basic questions about the teacher's gender, age, years of teaching experience, and title; the second part is a self-assessment test of the teacher's teaching ability according to the four variables of social security system, teacher training, willingness to learn, teacher management. A five-point Likert scale was used for the test, with scores ranging from 5 to 1 for strongly agree, agree, neutral, disagree, and completely disagree.

3.2 Research Design

This study adopts quantitative research. According to Teacher Professional Development Theory, the study mainly focuses on teachers' self-assessment, with a total of 31 questions in the questionnaire, which is based on a scale. Factors affecting teachers' teaching ability are divided. The first part is the survey of basic information, the question type is multiple choice, including the gender and degree of the respondents. The second part is the influencing factors, social security system involves five items, teacher training five items, willingness to learn five items, teacher management five items, teachers' pedagogical See Table 3.1.

Table 3.1 The Measurement Items

Variate	Measurement item	NO.
Social Security System	1.Do teachers' benefits in the social security system affect their teaching performance?	Q1
	2.Does security and stability in the social security system have an impact on teachers' teaching performance?	Q2
	3.Does welfare security in the social security system have an impact on teachers' career satisfaction and motivation?	Q3
	4.Is there a correlation between teachers' health and welfare security in the social security system and their teaching quality and efficiency?	Q4
	5.Does pension and health security in the social security system have an impact on teachers' job stability?	Q5

Variate	Measurement item	NO.
Teacher Training	1.Does the training received by teachers have a significant impact on the development of their teaching competencies?	Q6
	2.Does teachers' participation in different forms of professional development activities have an impact on the development of their teaching competencies?	Q7
	3.Do the practical teaching and reflection components of teacher training have an impact on the development of teaching competence?	Q8
	4.Does the degree of integration of teaching theory and practice in teacher training affect teachers' pedagogical competence?	Q9
	5.Is there a differential impact of teacher training on teachers of different teaching ages and subject areas?	Q10
Willingness to Learn	1.Is there a correlation between teachers' willingness to learn and their ability to teach?	Q11
	2.Are teachers with a high willingness to learn more inclined to adopt pedagogical innovations and improvements?	Q12
	3.Is there a relationship between individual willingness to learn and organizational investment in teacher training?	Q13
	4.Is there an effect of willingness to learn on the extent to which teachers embrace new teaching methods and technologies?	Q14
	5.Does stimulating and sustaining teachers' willingness to learn improve their pedagogical competence?	Q15
Teacher Management	1.Do teacher management systems have an impact on the development of teachers' teaching competencies?	Q16
	2.Do motivational mechanisms in teacher management affect teachers' teaching performance and competence development?	Q17
	3.Do evaluation and feedback mechanisms in teacher management have an impact on the development of teachers' teaching competencies?	Q18
	4.Do career paths and promotion mechanisms in teacher management have an effect on the development of teachers' pedagogical competence?	Q19
	5.Do leadership styles and organizational cultures in teacher management have an impact on teachers' pedagogical competence?	Q20
Teacher Pedagogical Ability	1.Do you have a good understanding of what teacher competencies include?	Q21
	2.Do you have a good understanding of effective methods or tools for assessing teacher competencies?	Q22
	3.Do you have a good understanding of the factors that influence teacher competencies?	Q23

Variate	Measurement item	NO.
	4.Do you have a good understanding of the support and resources needed to improve teacher teaching competencies?	Q24
	5.Do you have a complete understanding of measuring growth in teacher teaching competencies?	Q25
	6.Do you have a complete understanding of how different levels of teacher teaching competence affect student learning outcomes and the quality of teaching?	Q26

3.3 Hypothesis

The independent variables in this study are the social security system, teacher training, willingness to learn, and teacher management. The dependent variable is teacher pedagogical ability, and the model is constructed based on the analysis and the relationship between the variables. The relationship between variables is set through hypotheses. Therefore, hypotheses are formulated:

H1: The Social Security System has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

H2: Teacher Training has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

H3: Willingness to Learn has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

H4: Teacher Management has a significant positive effect on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology.

Combined with the above analysis, the hypothetical model of the influencing factors of teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology, and the interrelationships among the variables are confirmed. See Figure 3.1.

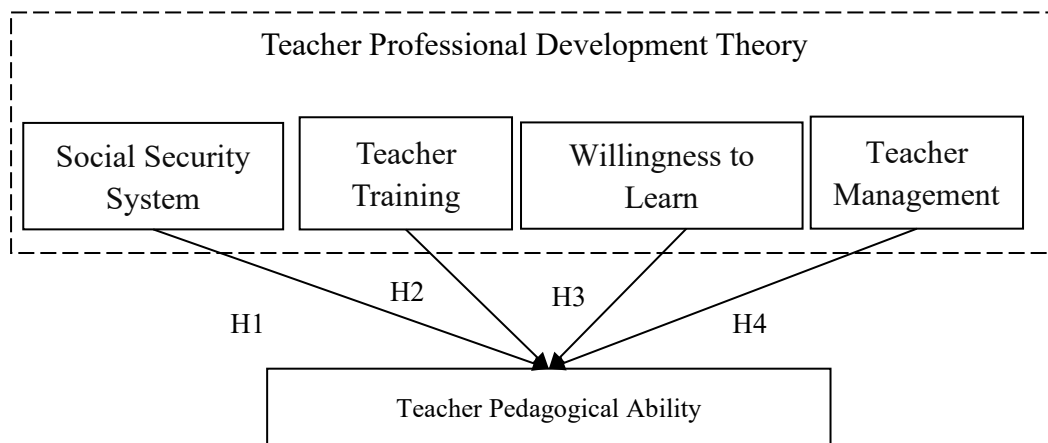


Figure 3.1 Hypotheses

3.4 Population and Sampling

The scope of this study is Shandong University of Engineering and Vocational Technology. Teachers of Shandong University of Engineering and Vocational Technology are the research population of this study. A survey was conducted on the teachers of Shandong University of Engineering and Vocational Technology to investigate the teachers' ability to self-assess their teaching ability and to understand the relevant systems and regulations of the university. In order to ensure the scientificity and validity of the survey, the sample was taken through the sampling method during the research process. The teachers of Shandong University of Engineering and Vocational Technology were numbered, and the numbers were randomly selected, with each number representing a teacher. According to the statistics of Shandong University of Engineering and Vocational Technology, there are 1300 teachers. Combined with the reliability of sample extraction of 99.9%, the sample size was calculated.

$$N = \frac{r^2 * \rho(1 - \rho)}{\beta^2}$$

The calculation gives the sample size for this sample survey as 377.89, so the number of people to be sampled is 378.

3.5 Data Collection

For the research on the factors affecting the improvement of teaching ability of teachers in Shandong University of Engineering and Vocational Technology, the survey targets teachers of Shandong University of Engineering and Vocational Technology, including teachers of various disciplines. The questionnaire was distributed by means of electronic questionnaires, and the link to the questionnaire could be sent through the school's e-mail system or online survey platform. Teachers fill in the questionnaire by

clicking on the questionnaire link, and the data are stored directly in the electronic database to ensure the security and integrity of the data. The collected data were cleaned and organized, including checking the recovery of the questionnaires, the completeness and logic of the data. The study period is from October 30, 2023 to January 30, 2024. After counting, 378 electronic questionnaires were distributed, and 303 valid questionnaires were recovered, with a recovery rate of 80.16%.

3.6 Data Analysis

3.6.1 Reliability

The questionnaire in this study is an adaptation of a mature questionnaire, which was partially adapted and integrated in this study, and the questionnaire itself was tested for reliability and validity. Reliability was tested using SPSS reliability analysis, which mainly examined the Cronbach's Alpha reliability coefficient. If the distance between Cronbach's Alpha reliability coefficient and 1 is small, it means that the reliability within the data is high, and vice versa, the lower the reliability. The result of the test in this study is shown in 3.2, the Cronbach's Alpha is 0.8 or more, which means that the questionnaire meets the inherent requirements of reliability. The Cronbach's Alpha coefficient of Social Security System is 0.895, the Cronbach's Alpha coefficient of Teacher Training is 0.878, the Cronbach's Alpha coefficient of Willingness to Learn is 0.868, and the Cronbach's Alpha coefficient of Teacher Management is 0.874, the Cronbach's Alpha coefficient of Teacher Pedagogical Ability is 0.876. All of them are in the range of 0.8~0.9, which indicates that the reliability of this paper's questionnaire is better, and then the validity can be further analyzed. This indicates that the reliability of the questionnaire of this survey study is very good, as shown in Table 3.2.

Table 3.2 Variate Reliability Test

Variate	Cronbach's Alpha	N of Items
Social Security System	0.895	5
Teacher Training	0.878	5
Willingness to Learn	0.868	5
Teacher Management	0.874	5
Teacher Pedagogical Ability	0.876	6

3.6.2 Validity

The questionnaire validity test was done by KMO and Barlrrt's ball test. According to the test standard of KMO value, if the value of KMO is less than 0.5, it means that the validity of the questionnaire is not good. When the value of KMO is closer to 1, it means that there are more common factors between the items of the questionnaire, and

it is more conducive to analyzing and testing of each factor. The results of the validity of this questionnaire are shown in Table 3.3, the overall KMO value of the questionnaire reaches 0.942, and Bartlett's ball test gets the significance value of 0.000, so this questionnaire has good validity.

Table 3.3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.942
Bartlett's Test of Sphericity	Approx. Chi-Square	4508.118
	df	325
	Sig.	0.000

Table 3.4 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	% of Variance	Cumulative %	% of Variance	Cumulative %
1	10.65	40.966	40.966	40.96	40.966	14.97	14.979
2	2.194	8.439	49.405	8.439	49.405	13.39	28.373
3	1.684	6.477	55.883	6.477	55.883	13.05	41.426
4	1.479	5.687	61.570	5.687	61.570	12.72	54.148
5	1.363	5.242	66.812	5.242	66.812	12.66	66.812
6	0.654	2.514	69.327				
7	0.620	2.385	71.712				
8	0.597	2.295	74.006				
9	0.574	2.207	76.213				
10	0.537	2.066	78.279				
11	0.514	1.977	80.256				
12	0.476	1.830	82.085				
13	0.459	1.767	83.852				
14	0.432	1.661	85.513				
15	0.427	1.643	87.156				
16	0.399	1.536	88.692				
17	0.379	1.456	90.148				
18	0.346	1.332	91.480				
19	0.331	1.274	92.754				
20	0.323	1.241	93.995				
21	0.307	1.180	95.175				
22	0.301	1.159	96.333				
23	0.263	1.012	97.346				
24	0.241	0.929	98.275				
25	0.227	0.874	99.148				
26	0.221	0.852	100.000				

Factor analysis of the scale of factors influencing the teaching competence of the questionnaire teachers was conducted using principal component analysis to examine the rationality of the scale dimensions setting. Factors with Eigen roots greater than 1 were extracted from the analysis and the cumulative total variance explained by the factors was 66.812%. Table 3.4 shows the results of factor analysis after rotation by maximum variance method. The calculation results by Rotated Component Matrixa show that the question-item differentiation validity of each factor is good, see Table 3.5.

Table 3.5 Rotated Component Matrix

	1	2	3	4	5
Q1	0.160	0.780	0.209	0.244	0.201
Q2	0.187	0.704	0.216	0.253	0.176
Q3	0.211	0.769	0.159	0.177	0.184
Q4	0.134	0.727	0.204	0.223	0.161
Q5	0.141	0.745	0.256	0.121	0.199
Q6	0.212	0.205	0.758	0.171	0.179
Q7	0.155	0.195	0.706	0.167	0.229
Q8	0.174	0.188	0.711	0.201	0.216
Q9	0.044	0.233	0.762	0.137	0.204
Q10	0.179	0.188	0.705	0.241	0.201
Q11	0.202	0.140	0.179	0.184	0.801
Q12	0.248	0.215	0.178	0.197	0.689
Q13	0.160	0.230	0.252	0.041	0.692
Q14	0.143	0.157	0.169	0.181	0.708
Q15	0.126	0.153	0.229	0.183	0.739
Q16	0.223	0.209	0.172	0.773	0.077
Q17	0.128	0.129	0.162	0.719	0.217
Q18	0.299	0.185	0.306	0.665	0.195
Q19	0.147	0.226	0.167	0.738	0.148
Q20	0.167	0.225	0.145	0.726	0.171
Q21	0.780	0.114	0.146	0.160	0.146
Q22	0.731	0.034	0.175	0.222	0.144
Q23	0.705	0.215	0.095	0.040	0.180
Q24	0.763	0.143	0.192	0.142	0.125
Q25	0.709	0.220	0.040	0.141	0.158
Q26	0.723	0.077	0.093	0.174	0.096

The results of the study showed that the rotated principal component matrix revealed that the first factor ranged from 21 to 26 questions; the second factor ranged from 1 to 5 questions; the third factor ranged from 6 to 10 questions; the fourth factor ranged from 16 to 20 questions, and the fifth factor ranged from 11 to 15 questions. The four influential factors were named social security system, teacher training, willingness to learn, teacher management, and teacher pedagogical ability, according to the

characteristics of each factor. Through the results of Table 3.5, it can be learned that a total of five factors were extracted, and each variable has a large loading on only one common factor, while the loadings on the other common factors are small, indicating that each variable has a better but differentiated validity.



Chapter 4 Findings

4.1 Introduction

A total of 303 valid questionnaires were collected in the study, and the validity rate of the questionnaires was 80.16%. The collected data was analyzed by descriptive statistics, and the data conformed to normal distribution. Correlation was verified based on the hypothesized relationship between the variables that do not make sense. Pearson correlation analysis was used to determine the correlation and significance between each variable. Finally, the conclusions of the study were drawn based on the analysis.

4.2 Description of Statistical Variables

This study took the teachers of Shandong University of Engineering and Vocational Technology as the research object, and adopted the stratified random sampling method to survey the teachers of the school, covering all the professional teachers of the school. A total of 378 questionnaires were distributed to teachers of all majors, and 303 valid questionnaires were recovered, with an effective recovery rate of 80.16%. The sample distribution of the teachers' questionnaires is as follows: The male to female ratio and age distribution of the surveyed teachers are presented. The results show that 159 male teachers participated in the survey, accounting for 52.5% of the total number of teachers; 144 female teachers, accounting for 47.5% of the total number of teachers, the proportion of male and female teachers is basically equal. In terms of teachers' age, there were 45 teachers between 18 and 25 years old, accounting for 14.9%; 34 teachers between 26 and 30 years old, accounting for 11.2%; 55 teachers between 31 and 35 years old, accounting for 18.2%; 62 teachers between 36 and 40 years old, accounting for 20.5%; and 107 teachers over 40 years old, accounting for 35.3%. As shown in Table 4.1. The sample as a whole met the statistical requirements.

Table 4.1 Distribution of Gender-Age of Samples (N = 303)

Item	Options	Frequency	Percent%
Gender	Male	159	52.5
	Female	144	47.5
Age	18-25	45	14.9
	26-30	34	11.2
	31-35	55	18.2
	36-40	62	20.5
	Over 40	107	35.3
Total		303	100.0

Table 4.2 Distribution of Education-Position-Tenure of Samples (N = 303)

Item	Options	Frequency	Percent%
Education	Bachelor's degree	190	62.7
	Master degree	99	32.7
	Higher than the Master's degree	14	4.6
Position	Operation	136	44.9
	Manager/senior	60	19.8
	Lecturer/instructor	34	11.2
	Other	73	24.1
Tenure	Less than/or equal to 5	42	13.9
	Between 6-10	112	37.0
	Between 11–15	138	45.5
	16 and over	11	3.6
Total		303	100.0

The results of teachers' education, title and teaching experience show (Table 4.2) that among the teachers surveyed, 99 of them have Master's degree and above, accounting for 32.7% of the total number of teachers; 190 teachers have bachelor's degree, which still accounts for more than 62.7% of the overall number of teachers: and another 14 of them have Higher than the Master's degree, accounting for 4.6%. In terms of job title, there were 136 Operation teachers, accounting for 44.9% of the total number of teachers, and 34 lecturers/instructors, accounting for 11.2% of the total number of teachers, accounting for the lowest proportion of the total number of teachers. The number of teachers with less than 5 years of teaching experience (including 5 years) is 42, 6-10 years 112, 11-15 years 138, and more than 16 years (including 16 years) is 11.

Descriptive statistics were analyzed for each question item for each variable. The main measurements were the maximum value, minimum value, mean and average of each question item and standard deviation of the variable. The analysis reveals that the maximum value of each question item is 5, the minimum value is 1 and the mean value is above 3.3. The mean of the variables can be found to be 3.49 for Social Security System, 3.56 for Teacher Training, 3.55 for Willingness to Learn, 3.58 for Teacher Management and 3.78 for Teacher Pedagogical Ability. Teacher Training, Willingness to Learn, Teacher Management, and Teacher Pedagogical Ability were 3.58, 3.78, 3.49, 3.56, 3.55, 3.58, 3.58, 3.78, and 3.78, respectively. The level of the four dimensions is not too broad. See Table 4.3.

Table 4.3 Descriptive Statistics

Various	Items	Min	Max	Mean	Total Mean	Std. Deviation
Social Security System	Q1	1	5	3.50	3.49	1.168
	Q2	1	5	3.51		1.179
	Q3	1	5	3.54		1.132
	Q4	1	5	3.41		1.054
	Q5	1	5	3.48		1.085
Teacher Training	Q6	1	5	3.49	3.56	1.145
	Q7	1	5	3.62		1.053
	Q8	1	5	3.56		1.166
	Q9	1	5	3.66		1.223
	Q10	1	5	3.47		1.209
Willingness to Learn	Q11	1	5	3.58	3.55	1.364
	Q12	1	5	3.57		1.197
	Q13	1	5	3.39		1.077
	Q14	1	5	3.54		1.022
	Q15	1	5	3.65		1.124
Teacher Management	Q16	1	5	3.62	3.58	1.233
	Q17	1	5	3.52		1.136
	Q18	1	5	3.69		1.296
	Q19	1	5	3.49		1.142
	Q20	1	5	3.57		1.174
Teacher Pedagogical Ability	Q21	1	5	3.84	3.78	1.087
	Q22	1	5	3.71		1.092
	Q23	1	5	3.78		1.145
	Q24	1	5	3.67		1.152
	Q25	1	5	3.83		1.095
	Q26	1	5	3.83		1.051

4.3 Results of the Study

Correlation analysis is the process of analyzing two or more elements of a variable that are correlated, in order to measure the closeness of the correlation between two elements of the variable. There needs to be a certain link or probability between the correlated elements for correlation analysis to take place. In order to be able to explore the relationship between different groups. Correlation analysis has definitely become the best method of statistical analysis. Pearson's correlation coefficient: It is suitable for two groups of variables that are continuous, and works best when they satisfy an approximately normal distribution and are linearly related. Pearson's correlation coefficient is a statistical measure used to reflect the degree of linear correlation

between two variables. The correlation coefficient is denoted by r , where n is the sample size, and n is the observed and mean values of the two variables. r describes the degree of linear correlation between the two variables, and the larger the absolute value of r , the stronger the correlation is. Based on the results of the above analysis, it can be seen that there is a 99% significant correlation between the variables. And the correlation coefficient is greater than 0, so all are positively correlated.

Table 4.4 Correlation Between Variables (Pearson Correlation Matrix)

	Social Security System	Teacher Training	Willingness to Learn	Teacher Management	Teacher Pedagogical Ability
Social Security System	1	.584**	.543**	.575**	.462**
		0.000	0.000	0.000	0.000
	303	303	303	303	303
Teacher Training	.584**	1	.581**	.559**	.442**
	0.000		0.000	0.000	0.000
	303	303	303	303	303
Willingness to Learn	.543**	.581**	1	.513**	.478**
	0.000	0.000		0.000	0.000
	303	303	303	303	303
Teacher Management	.575**	.559**	.513**	1	.502**
	0.000	0.000	0.000		0.000
	303	303	303	303	303
Teacher Pedagogical Ability	.462**	.442**	.478**	.502**	1
	0.000	0.000	0.000	0.000	
	303	303	303	303	303

NOTE: *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation coefficient between the social security system and teacher pedagogical ability is 0.462, and $P < 0.01$, indicating that there is a correlation between the social security system and teacher pedagogical ability, and it is a general correlation.

The Pearson correlation coefficient between teacher training and teacher pedagogical ability is 0.442, and $P < 0.01$, indicating that there is a correlation between teacher training and teacher pedagogical ability, and it is a general correlation.

The Pearson correlation coefficient between willingness to learn and teacher pedagogical ability is 0.478, and $P < 0.01$, indicating that there is a correlation between willingness to learn and teacher pedagogical ability, and it is a general correlation.

The Pearson correlation coefficient between teacher management and teacher pedagogical ability is 0.502, and $P < 0.01$, indicating that there is a correlation between teacher management and teacher pedagogical ability, and it is a general correlation.

The Pearson correlation coefficient between the social security system and teacher management is 0.575, and $P < 0.01$, indicating that there is a correlation between the social security system and teacher management, and it is a general correlation.

The Pearson correlation coefficient between willingness to learn and teacher management is 0.559, and $P < 0.01$, indicating that there is a correlation between willingness to learn and teacher management, and it is a general correlation.

The Pearson correlation coefficient between the social security system and teacher management is 0.513, and $P < 0.01$, indicating that there is a correlation between the social security system and teacher management, and it is a general correlation.

The Pearson correlation coefficient between the social security system and willingness to learn is 0.543, and $P < 0.01$, indicating that there is a correlation between the social security system and willingness to learn, and it is a general correlation.

The Pearson correlation coefficient between teacher training and willingness to learn is 0.581, and $P < 0.01$, indicating that there is a correlation between teacher training and willingness to learn, and it is a general correlation.

The Pearson correlation coefficient between teacher training and the social security system is 0.584, and $P < 0.01$, indicating that there is a correlation between teacher training and the social security system, and it is a general correlation.

Therefore, according to the results of data analysis, the social security system has a significant positive impact on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. Hypothesis H1 holds. Teacher training has a significant positive impact on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. Hypothesis H2 holds. Willingness to learn has a significant positive impact on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. Hypothesis H3 holds. Teacher management has a significant positive impact on teacher pedagogical ability enhancement in Shandong University of Engineering and Vocational Technology. Hypothesis H4 holds.

Chapter 5 Conclusion and Recommendation

5.1 Conclusion

A total of 303 questionnaires collected in the study were valid, with a validity rate of 80.16%. This chapter focuses on analyzing the factors affecting teachers' teaching ability and proposing countermeasures. Firstly, the factors affecting teachers' teaching ability are categorized theoretically, and the social security system, teacher training, willingness to learn, teacher management are considered as important factors affecting the development of teachers' ability, and how they affect the development of teachers' teaching ability is elaborated. A detailed elaboration was made. Then through correlation analysis, the degree of influence of each of the above factors on teachers' teaching competence was analyzed. The results show that all four types of influencing factors have a significant impact on teachers' teaching ability, and teacher training, willingness to learn, and teacher management have almost the same degree of influence. Through the study of the influencing factors of teaching ability, it provides a good basis for the countermeasures and management suggestions for the development of teachers' teaching ability in the later paper. The study of the factors affecting teaching ability provides a good basis for the countermeasures and management suggestions for the development of teachers' teaching ability proposed later.

5.1.1 The Social Security System Has a Significant Positive Effect on Teacher Pedagogical Ability Enhancement

The Pearson correlation coefficient between the Social Security System and Teacher Pedagogical Ability is 0.462, and $P < 0.01$, indicating that there is a correlation between the Social Security System and Teacher Pedagogical Ability, and it is a general correlation. This study found a correlation between the social security system and teachers' ability to teach, which was quantitatively analyzed through the Pearson correlation coefficient. The correlation coefficient of 0.462 indicates that there is some degree of positive correlation between the two, i.e., as the social security system improves or strengthens, teachers' teaching ability may improve. The existence of this relationship is supported by a p-value of less than 0.01, which implies that the correlation is unlikely to be due to random factors, but is statistically significant. Correlation is not the same as causation. Although this study found a correlation between SSI and teachers' teaching ability, it does not establish a causal relationship. In other words, it cannot simply be assumed that improving the social security system will directly lead to improving teachers' teaching competence, or that improving teachers' teaching competence will automatically lead to improving the social security system. This may involve more complex social, economic and educational factors, and further research is needed to delve deeper into the specific relationship between the two, as well as possible causal mechanisms.

5.1.2 Teacher Training Has a Significant Positive Effect on Teacher Pedagogical Ability Enhancement

The Pearson correlation coefficient between Teacher Training and Teacher Pedagogical Ability is 0.442, and $P < 0.01$, indicating that there is a correlation between Teacher Training and Teacher Pedagogical Ability, and it is a general correlation. When the Pearson correlation coefficient is 0.442, it indicates that there is a moderate positive correlation between teacher training and teachers' teaching competence. This implies that there is a congruence between the level of training received by teachers and their teaching competence, i.e. the higher the level of training, the higher the teaching competence is likely to increase accordingly. However, the value of the correlation coefficient is not perfectly positive indicating that training is not the only factor that affects teaching competence, but may also be influenced by other factors such as individual aptitude, teaching experience, etc. $p < 0.01$ suggests that this correlation did not occur by chance and is statistically significant. This means that when performing the statistical analysis, we can exclude the correlation due to random errors and therefore this correlation is real and not due to sample error or chance. The results of this study suggest that the training received by teachers may have a positive impact on their ability to teach, but it is not certain that the training is the direct cause of the improvement, and there may be other influencing factors. Therefore, while investment and efforts in teacher training may provide some support for improving teachers' teaching competence, there is a need to take into account the impact of other factors on teaching competence in order to develop more comprehensive and effective education policies and training programs.

5.1.3 Willingness to Learn Has a Significant Positive Effect on Teacher Pedagogical Ability Enhancement

The Pearson correlation coefficient between Willingness to Learn and Teacher Pedagogical Ability is 0.478, and $P < 0.01$, indicating that there is a correlation between Willingness to Learn and Teacher Pedagogical Ability, and it is a general correlation. When the Pearson correlation coefficient is 0.478, it indicates that there is a moderate positive correlation between willingness to learn and teachers' teaching ability. This implies that there is a congruence between the degree of students' willingness to learn and teachers' ability to teach, i.e., the higher the degree of students' willingness to learn, the higher the teachers' ability to teach may correspondingly increase. However, the value of the correlation coefficient is not perfectly positive, indicating that willingness to learn is not the only factor that affects teaching ability, but may also be influenced by other factors such as students' backgrounds, school environments, etc. $p < 0.01$ suggests that this correlation does not occur by chance and is statistically significant. This means that when performing the statistical analysis, we can exclude the correlation

due to random error, so this correlation is real and not due to sample error or chance. The results of this study indicate that there is a correlation between willingness to learn and teachers' teaching competence, but it is not certain that willingness to learn is a direct cause of improved teaching competence, and that there may be other influencing factors. Therefore, in the process of improving teachers' teaching ability, students' willingness to learn as well as other influencing factors need to be taken into account to develop appropriate teaching strategies and training programs to better meet students' learning needs.

5.1.4 Teacher Management Has a Significant Positive Effect on Teacher Pedagogical Ability Enhancement

The Pearson correlation coefficient between Teacher Management and Teacher Pedagogical Ability is 0.502, and $P < 0.01$, indicating that there is a correlation between Teacher Management and Teacher Pedagogical Ability, and it is a general correlation. When the Pearson's correlation coefficient is 0.502, it indicates that there is a moderate positive correlation between teachers' management and teachers' teaching ability. This implies that there is a congruence between teachers' managerial competence and their teaching competence, i.e., the stronger the teacher's managerial competence, the higher the teaching competence is likely to be accordingly. However, the value of the correlation coefficient is not perfectly positive indicating that teacher management competence is not the only factor that affects teaching competence, but may also be affected by other factors. $p < 0.01$ indicates that the occurrence of this correlation is not by chance and is statistically significant. This means that when performing the statistical analysis, we can exclude the correlation due to random errors and therefore this correlation is real and not due to sample error or chance. The results of this study indicate that there is a correlation between teacher management and teachers' teaching competence, but it is not certain that teacher management is directly responsible for the improvement of teaching competence, and that there may be other influencing factors. Therefore, in the process of improving teachers' teaching ability, it is necessary to consider teachers' management ability as well as other influencing factors, and to develop appropriate training and support measures in order to better improve teacher overall quality and teaching level.

Table 5.1 Hypothesis Testing

NO.	Hypothesis	Result
H1	The Social Security System has a significant positive effect on teacher pedagogical ability enhancement.	Established
H2	Teacher Training has a significant positive effect on teacher pedagogical ability enhancement.	Established
H3	Willingness to Learn has a significant positive effect on teacher pedagogical ability enhancement.	Established
H4	Teacher Management has a significant positive effect on teacher pedagogical ability enhancement.	Established

5.2 Recommendations

5.2.1 Improving the Social Security System

The development of teachers' teaching ability cannot be supported without financial input. The Government still needs to continue to increase its financial input to schools, helping them to broaden their sources of funding and guiding organizations to keep investing in them, so as to ensure that education develops steadily and positively and to provide strong support for the improvement of the level of teachers' competence. Regular adjustments should be made to teachers' salaries, and consideration should be given to linking them to the rate of inflation in order to maintain the real purchasing power of the salaries. In addition, differentiated pay can be set according to factors such as teachers' years of teaching experience, academic qualifications and titles, to incentivize teachers to improve their personal qualities and professional abilities. Establish a sound social security system, including pension insurance, medical insurance and unemployment insurance, to provide teachers with all-round protection. Funds can be raised in a variety of ways, such as government funding, individual contributions and social donations, to ensure that teachers have stable pension and medical protection after retirement.

Provide teachers with opportunities for further studies and training, such as organizing professional training courses and academic seminars for them to improve their educational standards and professional skills. At the same time, establish a sound promotion system and appraisal mechanism to provide teachers with a broad space for career development. Invest in improving the teaching facilities and conditions of schools, and provide a favorable working environment and teaching resources, such as updating teaching equipment, expanding classrooms, improving teaching aids, etc., so as to enhance teachers' work efficiency and job satisfaction. Establish a scientific and reasonable performance appraisal mechanism to reward and incentivize teachers according to their teaching standards, teaching achievements, student evaluations and other factors. This can stimulate teachers' motivation and creativity and improve their teaching quality and work efficiency. Providing additional benefits and support, such as housing subsidies, children's education subsidies, occupational health protection, etc., improves teachers' quality of life and job satisfaction, and enhances their sense of belonging and loyalty. Through the implementation of the above measures, the social security system and treatment of teachers can be gradually improved to enhance their motivation and work efficiency, thereby promoting the sustainable development of education.

5.2.2 Optimizing Teacher Training

Teacher training is the most direct and effective way to improve teaching skills. Today's teacher education takes a generally more conventional approach to theoretical training, such as conferences, lectures, training courses or workshops, and so on. These methods certainly give teachers the opportunity to learn and communicate with each other, but they also have the limitation of unclear training objectives. Higher education emphasizes the cultivation of teachers' practical ability, and the traditional teacher training mode applies to the theoretical teaching activities in the classroom, focusing on the cultivation of the ability of teaching design, teaching methodology, teaching implementation and evaluation, and it is often difficult to involve in the practical operation. Therefore, teacher training in higher education should truly understand the needs of teacher training, select appropriate training content, and combine various forms of training activities. It is to organize more teachers to participate in professional practice skills competition. Practical skills competition is not only a kind of display and review of teachers' practical ability, but also a way and platform for teachers to improve their practical teaching ability. Participating teachers can not only find the gaps and deficiencies in the competition with other teachers, but also discuss and exchange experiences with other teachers under the competition, so as to make up for their shortcomings.

Organize teachers' in-depth practice in enterprises. Schools and enterprises establish a long-term cooperation model, pairing up with professional and technical personnel in enterprises, turning production sites into training bases, and improving the level of practice in the environment of "learning to do" and "learning by doing". Implementation of practical guidance. Young teachers are an important part of the teaching force, they have the enthusiasm and motivation, subjectively higher requirements for the level of teaching ability, but due to the lack of practical experience is often unable to do, which requires experienced teachers to give guidance and help. Schools to do a good job of young teachers to drive the work, can directly drive young teachers to improve their teaching ability, but also to the young teachers to bring great psychological encouragement, inspire them to greater enthusiasm for learning and work.

5.2.3 Raising Willingness to Learn

The key to teacher growth lies in the individual. No matter how well the government and schools do their work, it is difficult to achieve results if the teachers themselves have a poor attitude toward teaching, a lack of responsibility, and no enthusiasm for learning. Therefore, as the state attaches importance to higher education, teachers need to change their concepts, correctly view the current situation of vocational education, and improve the awareness of self-learning. And the improvement of teachers' self-learning consciousness requires the joint efforts of external and internal factors. In terms of external factors, society and schools should create a good teaching

environment, pay attention to and develop education to change people's inherent knowledge of the school, reverse the reputation of education, increase the treatment of teachers, enhance the sense of happiness of teachers' profession; internal factors, the teachers themselves should set up the correct professional values, correct professional attitudes, enhance the sense of responsibility of the teachers, the cause of education as their own, and devote themselves to teaching. internal factors. Only under the joint action of external and internal factors can teachers give full play to their personal initiative, establish a sense of independent learning, and take the initiative to learn and make progress.

5.2.4 Transform Teacher Management

Teacher management is the process of effectively organizing, directing and supervising the teaching force to improve the quality of education and teaching and the effectiveness of school management. Teacher management includes recruitment and selection of suitable teachers. This includes determining the recruitment requirements, releasing recruitment information, screening resumes, and interviewing and evaluating. Through a rigorous selection process, teachers with professionalism, teaching ability and educational sentiments are chosen. Establish a sound title evaluation system, which evaluates teachers according to their teaching level, scientific research achievements, and education and teaching management, and motivates them to improve their quality. At the same time, promotion policies are formulated to provide teachers with opportunities and conditions for promotion. Teachers' teaching activities are managed and guided, including curriculum, teaching methods, and teaching quality assessment. To improve the teaching standard and effectiveness of teachers by formulating teaching plans, organizing teaching and research activities, and carrying out teaching supervision. Provide opportunities for teachers' career development and professional training to help teachers improve their quality and professional competence. This includes attending training courses, learning advanced educational concepts and methods, and conducting educational research activities. Establish a scientific and reasonable performance appraisal system to assess teachers based on their teaching quality, teaching achievements, student evaluations, etc., and provide them with appropriate rewards and incentives to stimulate their work motivation and creativity. Teachers are evaluated regularly to identify problems and provide guidance and support in a timely manner. At the same time, personalized teacher development plans are formulated to help teachers achieve their career development goals. Teacher management involves all aspects of the teaching force, including recruitment and selection, title evaluation and promotion, teaching management, teacher development and training, performance appraisal and incentives, and teacher relationship management. Through scientific and effective teacher management, the overall quality and teaching level of the teaching force can be improved, and the benign development of the school can be promoted.

References

- Alimmudin, A. (2022). The effect of teacher competence, work discipline and work motivation on teacher performance. *International Journal of Social Science and Human Research*, 05(06). <https://doi.org/10.47191/ijsshr/v5-i6-67>
- Bishop, R., & Berryman, M. (2010). Te kotahitanga: Culturally responsive professional development for teachers. *Teacher Development*, 14(2), 173–187. <https://doi.org/10.1080/13664530.2010.494497>
- Brodie, K. (2019). Teacher agency in professional learning communities. *Professional Development in Education*, 47(4), 1–14. <https://doi.org/10.1080/19415257.2019.1689523>
- Brown, J. S., Collins, A., & Duguid, P. (2019). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32–42. <https://doi.org/10.3102/0013189x018001032>
- Chen, J. (2020). Understanding teacher leaders' behaviours: Development and validation of the teacher leadership inventory. *Educational Management Administration & Leadership*, 3(23), 174114322094570. <https://doi.org/10.1177/1741143220945704>
- Demsetz, H., & Lehn, K. (2023). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, 93(6), 1155–1177.
- Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, 10(4), 86. <https://doi.org/10.3390/soc10040086>
- Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Fineberg, H., Garcia, P., Ke, Y., Kelley, P., Kistnasamy, B., Meleis, A., Naylor, D., Pablos-Mendez, A., Reddy, S., Scrimshaw, S., Sepulveda, J., Serwadda, D., & Zurayk, H. (2020). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, 376(9756), 1923–1958.
- Friedman, M., & Savage, L. J. (2020). The utility analysis of choices involving risk. *Journal of Political Economy*, 56(4), 279–304. <https://doi.org/10.1086/256692>
- Hachfeld, A., Hahn, A., Schroeder, S., Anders, Y., & Kunter, M. (2015). Should teachers be colorblind? How multicultural and egalitarian beliefs differentially relate to aspects of teachers' professional competence for teaching in diverse classrooms. *Teaching and Teacher Education*, 48(1), 44–55. <https://doi.org/10.1016/j.tate.2015.02.001>

- Huda, M. (2019). The problematic: Teachers' pedagogical ability in using technology on mathematics learning of junior high school. *Journal of Physics: Conference Series*, 1200(34), 012009. <https://doi.org/10.1088/1742-6596/1200/1/012009>
- Kim Min Jeong. (2017). A comparative study on dance teaching theory ability and dance teaching ability according to the training of cultural arts educators. *Korean Journal of Dance*, 17(1), 23–31. <https://doi.org/10.26743/kaod.2017.17.1.003>
- King, F. (2016). Teacher professional development to support teacher professional learning: Systemic factors from Irish case studies. *Teacher Development*, 20(4), 574–594. <https://doi.org/10.1080/13664530.2016.1161661>
- Kodron, C. (1993). European dimension, multiculturalism and teacher training. an experience in a network of training institutions. *European Journal of Teacher Education*, 16(1), 69–77. <https://doi.org/10.1080/0261976930160109>
- Long, H., Zhang, Y., & Tu, S. (2019). Rural vitalization in China: A perspective of land consolidation. *Journal of Geographical Sciences*, 29(4), 517–530. <https://doi.org/10.1007/s11442-019-1599-9>
- Marsh, B., & Mitchell, N. (2014). The role of video in teacher professional development. *Teacher Development*, 18(3), 403–417. <https://doi.org/10.1080/13664530.2014.938106>
- Mary, B., & Takashi, S. (2019). Effects of initial teacher training reform in England on subject teacher training: Example of geography teacher training. *E-Journal GEO*, 14(2), 404–412. <https://doi.org/10.4157/ejgeo.14.404>
- Phillips McDougall, P., Shane, S., & Oviatt, B. M. (2019). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing*, 9(6), 469–487. [https://doi.org/10.1016/0883-9026\(94\)90017-5](https://doi.org/10.1016/0883-9026(94)90017-5)
- Radkevych, V., Kravets, S., Herliand, T., Radkevych, O., & Kozak, A. (2021). Modern technologies in the development of professional competence in teachers from professional (vocational) education schools. *Journal of Physics: Conference Series*, 1840(1), 012041. <https://doi.org/10.1088/1742-6596/1840/1/012041>
- Rajagukguk, W. (2017). The influence of incipient ability, independent learning to critical thinking ability through teaching material inquiry-based. *Advances in Social Sciences Research Journal*, 4(8). <https://doi.org/10.14738/assrj.48.3043>

- Richards, J. C. (2011). Exploring teacher competence in language teaching. *The Language Teacher*, 35(4), 3. <https://doi.org/10.37546/jalttlt35.4-2>
- Roddy, C., Amiet, D. L., Chung, J., Holt, C., Shaw, L., McKenzie, S., Garivaldis, F., Lodge, J. M., & Mundy, M. E. (2017). Applying best practice online learning, teaching, and support to intensive online environments: An integrative review. *Frontiers in Education*, 2(59). <https://doi.org/10.3389/educ.2017.00059>
- Sánchez-Prieto, J., Trujillo-Torres, J. M., Gómez-García, M., & Gómez-García, G. (2021). Incident factors in the sustainable development of digital teaching competence in dual vocational education and training teachers. *European Journal of Investigation in Health, Psychology and Education*, 11(3), 758–769. <https://doi.org/10.3390/ejihpe11030054>
- Soine, K. M., & Lumpe, A. (2014). Measuring characteristics of teacher professional development. *Teacher Development*, 18(3), 303–333. <https://doi.org/10.1080/13664530.2014.911775>
- Supovitz, J. A. (2017). Teacher leaders' work with peers in a quasi-formal teacher leadership model. *School Leadership & Management*, 38(1), 53–79. <https://doi.org/10.1080/13632434.2017.1389718>
- Susanto, R., Asmi Rozali, Y., & Agustina, N. (2019). Development of pedagogical competency models for elementary school teachers: Pedagogical knowledge, reflective ability, emotional intelligence and instructional communication pattern. *Universal Journal of Educational Research*, 7(10), 2124–2132. <https://doi.org/10.13189/ujer.2019.071010>
- Svendsen, B. (2016). Teachers' experience from a school-based collaborative teacher professional development programmed: Reported impact on professional development. *Teacher Development*, 20(3), 313–328. <https://doi.org/10.1080/13664530.2016.1149512>
- Tacconi, G., Tütlys, V., Perini, M., & Gedvilienė, G. (2021). Development of pedagogical competencies of the vocational teachers in Italy and Lithuania: Implications of competence-based VET curriculum reforms. *European Journal of Training and Development*, 45(6/7), 526–546. <https://doi.org/10.1108/ejtd-03-2020-0041>
- Yaşar, Şe., Baker, D., Robinson-Kurpius, S., Krause, S., & Roberts, C. (2006). Development of a survey to assess K-12 teachers' perceptions of engineers and familiarity with teaching design, engineering, and technology. *Journal of Engineering Education*, 95(3), 205–216. [36](https://doi.org/10.1002/j.2168-</p>
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9830.2006.tb00893.x

- Zeng, Y., Guo, H., Yao, Y., & Huang, L. (2019). The formation of agricultural e-commerce clusters: A case from China. *Growth and Change*, 50(4), 1356–1374. <https://doi.org/10.1111/grow.12327>
- Zhiyong, S. (2020). College English language teaching reform and key factors determining EFL teachers' professional development. *European Journal of Educational Research*, 9(4), 1393–1404. <https://doi.org/10.12973/eu-jer.9.4.1393>
- Zhu, T. (2021). The reform of digital media art professional curriculum system based on internet technology. *Journal of Physics: Conference Series*, 1992(3), 032121. <https://doi.org/10.1088/1742-6596/1992/3/032121>



Appendix Questionnaire

Dear Sir/Madam,

Thank you for your participation in this questionnaire survey. The survey will be conducted anonymously, and your relevant information will be kept confidential. Thank you again for your cooperation.

Part I :

1. Gender Male Female
2. Age A. 18-34 B. 35-44 C. 45-54 D. above 54
3. Education 1. Bachelor's degree 2. Master degree
 3. Higher than the Master's degree 4. Other
4. Position 1. Operation 2. Manager/senior
 3. Lecturer/instructor 4. Other
5. Tenure in current position (year)
 1. Less than/or equal to 5 2. Between 6-10
 3. Between 11–15 4. 16 and over

Part II: Please judge to what extent you agree with the following statement, please choose the most appropriate option, and mark the corresponding number "√". The questionnaire used Likert scale, ranging from 1 to 5 in which 1 indicates strongly disagree (or strongly disagree), 2 indicates relatively disagree (or relatively disagree), 3 indicates neutral, 4 indicates relatively agree (or relatively agree), and 5 indicates strongly agree (or strongly agree)

Measuring item	Strongly disagree	Disagree	General	Agree	Strongly agree
Social Security System					
1.Do teachers' benefits in the social security system affect their teaching performance?					
2.Does security and stability in the social security system have an impact on teachers' teaching performance?					
3.Does welfare security in the social security system have an impact on teachers' career satisfaction and motivation?					
4.Is there a correlation between teachers' health and welfare security in the social security system and their teaching quality and efficiency?					
5.Does pension and health security in the social security system have an impact on teachers' job stability?					
Teacher Training					
1.Does the training received by teachers have a significant impact on the development of their teaching competencies?					
2.Does teachers' participation in different forms of professional development activities have an impact on the development of their teaching competencies?					
3.Do the practical teaching and reflection components of teacher training have an impact on the development of teaching competence?					
4.Does the degree of integration of teaching theory and practice in teacher training affect teachers' pedagogical competence?					

5. Is there a differential impact of teacher training on teachers of different teaching ages and subject areas?					
Willingness to Learn					
1. Is there a correlation between teachers' willingness to learn and their ability to teach?					
2. Are teachers with a high willingness to learn more inclined to adopt pedagogical innovations and improvements?					
3. Is there a relationship between individual willingness to learn and organizational investment in teacher training?					
4. Is there an effect of willingness to learn on the extent to which teachers embrace new teaching methods and technologies?					
5. Does stimulating and sustaining teachers' willingness to learn improve their pedagogical competence?					
Teacher Management					
1. Do teacher management systems have an impact on the development of teachers' teaching competencies?					
2. Do motivational mechanisms in teacher management affect teachers' teaching performance and competence development?					
3. Do evaluation and feedback mechanisms in teacher management have an impact on the development of teachers' teaching competencies?					
4. Do career paths and promotion mechanisms in teacher management have an effect on the development of teachers' pedagogical competence?					

5.Do leadership styles and organizational cultures in teacher management have an impact on teachers' pedagogical competence?					
Teacher Pedagogical Ability					
1.Do you have a good understanding of what teacher competencies include?					
2.Do you have a good understanding of effective methods or tools for assessing teacher competencies?					
3.Do you have a good understanding of the factors that influence teacher competencies?					
4.Do you have a good understanding of the support and resources needed to improve teacher teaching competencies?					
5.Do you have a complete understanding of measuring growth in teacher teaching competencies?					
6.Do you have a complete understanding of how different levels of teacher teaching competence affect student learning outcomes and the quality of teaching?					