



**THE FACTORS INFLUENCING RURAL PRIMARY SCHOOL
CHINESE LANGUAGE TEACHERS' ABILITY TO APPLY
INFORMATION TECHNOLOGY**

GAO RUOHAN
6617195739

**AN INDEPENDENT STUDY SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
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This Independent Study Has Been Approved as a Partial Fulfillment of the
Requirements for the Degree of Master of Business Administration

Advisor.....*Jidapa C.*.....
(Dr. Jidapa Chollathanrattanapong)

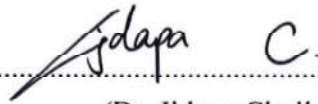
Date:*26*.....*Nov*.....*2025*.....

.....*[Signature]*.....
(Associate Professor Dr. Jomphong Mongkhonvanit)
Dean, Graduate School of Business

Date.....*27*.....*Nov*.....*2025*.....

Title: The Factors Influencing Rural Primary School Chinese Language Teachers' Ability to Apply Information Technology
Researcher: Gao Ruohan
Degree: Master of Business Administration
Major: Educational Management

Advisor:



(Dr. Jidapa Chollathanrattanapong)

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ABSTRACT

In the 21st century, information technology has advanced rapidly, especially with the development of network-based smart mobile platforms. Due to disparities in access to technological resources, the application of information technology in teaching is regionally limited. This study explored the factors influencing teachers' ability to apply information technology and presented the following research objectives: To analyze the impact of skill foundation, psychological state, teaching training and policy support on rural primary school Chinese language teachers' ability to apply information technology.

This study used a quantitative research approach. and designed a survey questionnaire. This study focuses on seven rural primary schools in Weifang City, with its research subjects encompassing all Chinese language teachers in these schools, totaling 186 individuals. After eliminating invalid questionnaires with missing information and those where all answers were the same, 180 valid questionnaires were ultimately obtained, resulting in a 96.7% response rate.

The regression analysis results support all hypotheses, indicating that skill foundation, psychological state, teacher training, and policy support all have significant positive effects on teachers' ability to apply information technology.

Based on the research findings, this study proposed several measures, including the combination of theory and practice, the establishment and improvement of the training mechanism and evaluation system, and the enhancement of the school's software and hardware infrastructure.

Key words: rural primary school, Chinese language teachers, skill foundation, psychological state, teacher training, policy support, information technology application ability



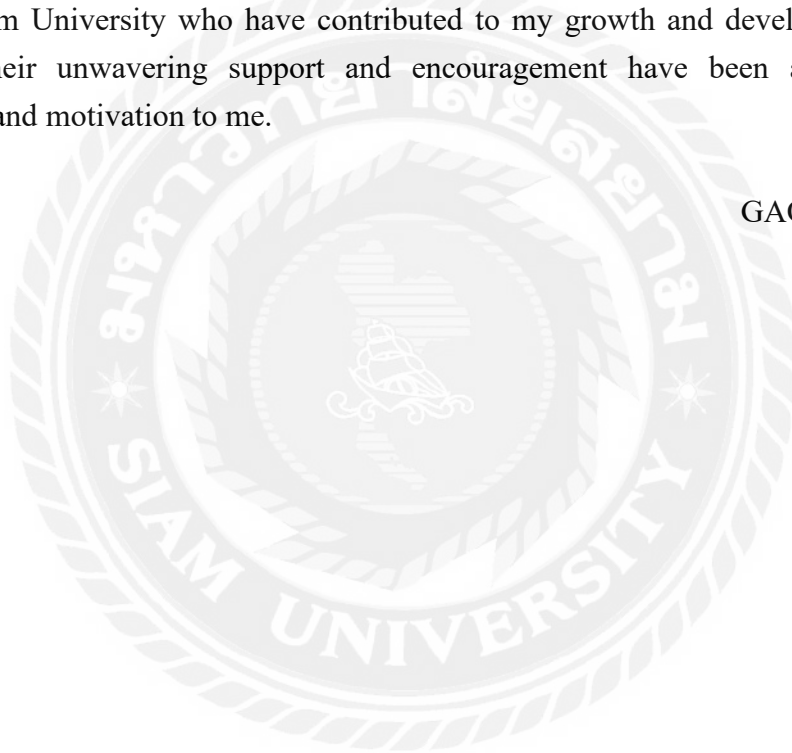
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GAO RUOHAN



DECLARATION

I, Gao Ruohan , hereby declare that this Independent Study entitled “*The Factors Influencing Rural Primary School Chinese Language Teachers’ Ability to Apply Information Technology* ” is an original work and has never been submitted to any academic institution for a degree.

(Gao Ruohan)



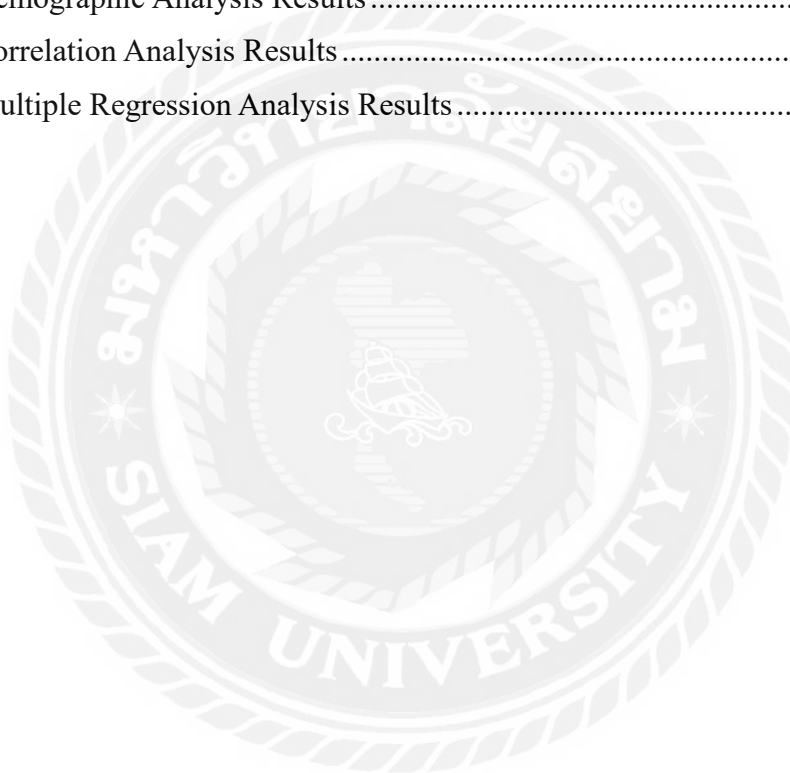
CONTENTS

ABSTRACT	I
ACKNOWLEDGEMENT	III
DECLARATION	IV
CONTENTS	V
LIST OF TABLES	VII
LIST OF FIGURES	VII
Chapter 1 Introduction	1
1.1 Background of the Study	1
1.2 Questions of the Study	2
1.3 Objectives of the Study	3
1.4 Scope of the Study	3
1.5 Significance of the Study	4
1.5.1 Theoretical Significance	4
1.5.2 Practical Significance	4
1.6 Definition of Key Terms	4
Chapter 2 Literature Review	6
2.1 Theoretical Foundation	6
2.1.1 Constructivist Learning Theory	6
2.1.2 Systematic Teaching Theory	7
2.2 Information Technology Application Ability	8
2.2.1 Skill Foundation	9
2.2.2 Psychological State	10
2.2.3 Teacher Training	11
2.2.4 Policy Support	12
2.3 Conceptual Framework	12
Chapter 3 Research Methodology	14
3.1 Research Design	14
3.2 Population and Sample	14
3.3 Hypothesis	14
3.4 Research Instrument	15
3.4.1 Skill Foundation Scale	15
3.4.2 Psychological State Scale	16
3.4.3 Teacher Training Scale	17

3.4.4 Policy Support Scale	18
3.4.5 Teachers' Ability to Apply Information Technology	18
3.5 Reliability and Validity Analysis of the Scale	19
3.5.1 Questionnaire Reliability Analysis	19
3.5.2 Questionnaire Validity Analysis	19
3.6 Data Collection	20
3.7 Data Analysis	20
Chapter 4 Findings	22
4.1 Introduction	22
4.2 Demographic Characteristics of Respondents	22
4.3 Correlation Analysis	23
4.4 Multiple Regression Analysis	24
Chapter 5 Conclusion and Recommendation	27
5.1 Conclusion	27
5.1.1 Skill Foundation Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology	27
5.1.2 Psychological State Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology	27
5.1.3 Teacher Training Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology	28
5.1.4 Policy Support Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology	28
5.2 Recommendation	29
5.2.1 Integrate Theory with Practice	29
5.2.2 Establish the Training Mechanism and Evaluation System	29
5.2.3 Improve the Software and Hardware Infrastructure of School	30
References	31
Appendix	35

LIST OF TABLES

Table 3.1 Skill Foundation Scale	16
Table 3.2 Psychological State Scale	17
Table 3.3 Teacher Training Scale	17
Table 3.4 Policy Support Scale	18
Table 3.5 Teachers' Ability to Apply Information Technology Scale	19
Table 3.6 Reliability Analysis Results	19
Table 3.7 Validity Analysis Results	20
Table 4.1 Demographic Analysis Results	22
Table 4.2 Correlation Analysis Results	23
Table 4.3 Multiple Regression Analysis Results	25



LIST OF FIGURES

Figure 2.1 Conceptual Framework.....	13
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Chapter 1 Introduction

1.1 Background of the Study

As a crucial element impacting society and the economy in the 21st century, information technology has advanced rapidly, especially with the development of network-based smart mobile platforms. National policies increasingly encourage various sectors to leverage the "Internet+" to transform traditional models, influencing and reshaping people's ways of living, learning, working, and thinking (He, 2006). The new round of technological revolution and industrial transformation is driving profound changes in various fields, including education. Emerging information technologies represented by cloud computing, big data, and artificial intelligence are giving rise to the call for "digital transformation in education," and are also reshaping the form and content of education. Teachers, as the supporting force for the development of education and teaching, are the core and key to the implementation of educational digital transformation. Empowering teachers' professional development with technology is not only a requirement for their individual growth, but also a necessity for the evolution of the digital transformation era (An, 2018). Therefore, in the background of educational digital transformation, teachers also need to possess abilities that are compatible with this environment.

The New Curriculum Standards for Primary School Chinese state: "The Chinese language curriculum should inherit the excellent traditions of Chinese education while embracing modernization, globalization, and future-oriented perspectives (Xu, 2020). It should broaden the fields of Chinese language learning and application, emphasizing interdisciplinary study and the use of modern technological tools. This approach allows students to expand their horizons, improve learning efficiency, and begin to develop the language proficiency required in modern society through the integration and interaction of diverse content and methods.(Wei & Deng, 2003)" The "New Curriculum Standards for Primary School Chinese" emphasize the importance of incorporating modern technological tools into Chinese language teaching. However, due to disparities in access to technological resources, the application of information technology in teaching is regionally limited. In schools in underdeveloped areas, factors such as low economic levels, outdated classroom hardware, and significant differences in teacher qualifications have resulted in varying levels of teachers' ability to use information technology effectively (Cai, 2009). Rural primary school teachers, representing a significant portion of the nation's teaching force, face higher expectations to integrate information technology into their educational

practices, making this a formidable challenge for them. Therefore, within the context of today's information society, the greatest challenge for rural primary school Chinese teachers is whether they can effectively and appropriately integrate information technology into their daily teaching practices.

1.2 Questions of the Study

Currently, despite efforts to promote urban-rural integration, the gap in educational development between urban and rural areas remains significant. One key indicator of this disparity is the difference in digital competency between urban and rural teachers. Teachers in urban and rural environments experience vastly different levels of exposure to digital resources, and rural teachers often lag considerably behind their urban counterparts in terms of information technology application ability (Guo & Chen, 2007). There exist significant differences among rural teacher workforce in terms of disciplines, educational stages, regions, and among different schools. It is highly challenging to achieve a substantial improvement in the quality of teacher workforce in a short period of time.

In the era of rapid technological advancements in information technology, how technology can empower the professional development of rural teachers has increasingly become a critical issue that needs urgent attention in the education sector. The new generation of information technology presents a rare opportunity for the professional development of rural teachers, and therefore, it is imperative to fully seize this opportunity and actively adapt to the new requirements of intelligent learning environments and the informatized society for their capabilities (Chen, 2022). Based on this, this study addresses the following questions:

- (1) Does skill foundation impact the information technology application ability of primary school Chinese language teachers in rural areas ?
- (2) Does psychological state impact the information technology application ability of primary school Chinese language teachers in rural areas?
- (3) Does teacher training impact the information technology application ability of primary school Chinese language teachers in rural areas?
- (4) Does policy support impact the information technology application ability of primary school Chinese language teachers in rural areas?

1.3 Objectives of the Study

In the process of educational reform, focusing on rural teachers' ability to apply information technology is crucial for promoting the informatization of rural education and implementing the universal sharing of quality educational resources. Nowadays, both teachers and students have transitioned from being “digital immigrants” to “digital natives,” and the simple application of information technology in teaching is far from sufficient to meet the demands. Information technology needs to be deeply integrated into the entire teaching process, transformed into an internal driving force for the reform of curriculum content and teaching methods, and play a fundamental and revolutionary role (Chen, 2000). Therefore, this study explores the factors influencing teachers' ability to apply information technology and presents the following research objectives.

(1) To explore the impact of skill foundation on the information technology application ability of primary school Chinese language teachers in rural areas.

(2) To explore the impact of psychological state on the information technology application ability of primary school Chinese language teachers in rural areas.

(3) To explore the impact of teacher training on the information technology application ability of primary school Chinese language teachers in rural areas

(4) To explore the impact of policy support on the information technology application ability of primary school Chinese language teachers in rural areas.

1.4 Scope of the Study

This study first organized and analyzed recent relevant research to understand the studies on the information technology application ability of rural teachers. This laid a solid theoretical foundation for the research and clarified the factors that influenced the ability of rural Chinese language teachers to apply information technology.

This study focused on seven rural primary schools in Weifang City, with its research subjects encompassing all Chinese language teachers in these schools, totaling 186 individuals. This study utilized WeChat to distribute questionnaires online. During the survey, rural teachers participating in the investigation were required to fill out the questionnaire based on their true situations. By understanding the factors that influenced primary school Chinese language teachers' ability to apply information technology, targeted strategies were proposed to improve their ability to apply information technology effectively.

1.5 Significance of the Study

1.5.1 Theoretical Significance

Based on relevant theoretical foundations, this study examines the information technology application ability of rural primary school Chinese language teachers, enriching the related theoretical research. Furthermore, it provides research insights to help primary school Chinese language teachers adapt to educational modernization and, to some extent, promote the improvement of their ability to apply information technology, optimizing and enhancing Chinese language teaching in schools in the new era. Lastly, the research on influencing factors can offer theoretical guidance and reference for related studies in other subjects.

1.5.2 Practical Significance

This study focuses on the real-life application of information technology by rural primary school Chinese language teachers in their teaching practices and their attitudes toward information technology. It helps to understand the current status and challenges of information technology application among rural primary school Chinese language teachers. At the same time, through the analysis of influencing factors, it identifies teacher-related factors and provides a reference for improving teachers' ability to apply information technology effectively.

At the same time, identifying the factors that influence rural primary school Chinese language teachers' ability to apply information technology provides a basis for schools to build an information technology environment and for training programs to enhance teachers' application ability.

1.6 Definition of Key Terms

(1) Information Technology Application Ability

The information technology application ability of teachers is based on the "Trial Standards" and serves as a means for teaching reform. It involves teachers' ability to integrate teaching resources, conduct teaching activities, and enrich teaching outcomes based on information technology. This is a skill that requires teachers to have strong practical abilities.

(2) Skill Foundation

The skill foundation primarily refers to the impact of the knowledge and skills in information technology that teachers have already mastered on their ability to apply information technology.

(3) Psychological State

Teachers' psychological state refers to the internal psychological condition and emotional responses displayed by teachers during teaching and work.

(4) Teacher Training

Teacher training involves professional development programs designed to enhance teachers' overall competence and professional skills. It also aims to optimize their knowledge structure, equip them with the latest knowledge, broaden their horizons, and promote the development of physical education teachers' research capabilities.

(5) Policy Support

Policy Support refers to the support and assistance provided by the government or relevant institutions through the formulation and implementation of various policies, regulations, and measures for specific sectors or groups.

Chapter 2 Literature Review

2.1 Theoretical Foundation

2.1.1 Constructivist Learning Theory

With the continuous development and widespread use of information technology, constructivist learning theory has provided an important theoretical foundation for information technology education, while information technology has created a favorable environment for the application of constructivist learning theory. According to the constructivist view of knowledge, knowledge is not static or unchanging; it evolves and transforms as people's understanding deepens. When faced with specific problems or situations, individuals will process and recreate existing knowledge (Xing et al., 2022). The view emphasizes that learning is an active process of cognitive construction, supported by teachers, learning partners, and other learning tools in a particular context (Sun, 2018). The view suggests that teachers should use learners' prior experiences as the starting point for new knowledge, guiding them to construct new knowledge and experiences. In its application, constructivism emphasizes contextual teaching, where teachers create engaging and authentic teaching environments or base the teaching on real-world problems.

Emerging information technologies continue to evolve, and the deepening development of educational informatization will inevitably change educational concepts, models, technologies, and evaluations (Ding et al., 2023). In this changing educational environment, the role of teachers has correspondingly transformed: from transmitters of knowledge to facilitators of meaning construction, stimulating students' interest in learning; as collaborators within a group, assisting students with collaborative learning supported by information technology, guiding them throughout the process and fostering harmonious teacher-student relationships; as developers and designers of curriculum resources, using information technology to expand and create teaching resources; and as cultivators of students' information literacy, enhancing their ability to apply information technology and promoting independent learning through various means (Xie, 2021). It is clear that in an informatized environment, the role of teachers becomes even more crucial, and the expectations for their capabilities are higher.

As the mother tongue, creating an authentic language environment is crucial in Chinese language education, and information technology has become an important tool for establishing such a learning environment. The "situational" aspect emphasized

by Constructivist Learning Theory provides guiding significance for integrating information technology with the Chinese language curriculum (Peng et al., 2015). The implication of constructivist learning theory for Chinese language teaching is that, during the teaching process, teachers should use modern information technology to create an authentic language learning environment based on the teaching content and objectives, facilitating students' independent exploration and collaborative learning. At the same time, modern information technology has transformed the teaching methods of Chinese language teachers and raised higher demands for their knowledge structure and abilities.

2.1.2 Systematic Teaching Theory

The essence of systematic instructional design is an empiricist approach to designing and improving teaching, primarily focusing on the organized and standardized design, implementation, and evaluation of both "teaching" and "learning." Programmed instruction involves analyzing content, breaking it down into specific behavioral objectives, designing the steps necessary to achieve these objectives, establishing procedures for trying out and revising these steps, and finally, validating the program based on the degree of achievement of the predetermined objectives (Gao & Sun, 2020). Programmed instruction can create a teaching technique by combining the above series of procedures. Although its scale may be small, it is very effective for self-study. Meanwhile, as people's ideas continue to evolve through practice, they gradually realize that learning outcomes are influenced by multiple factors. The individual and interactive effects of these factors complicate research in this area. Therefore, to achieve effective learning, the entire process requires scientific and standardized analysis and design.

Task analysis primarily focuses on learning objectives. It starts from specific instructional requirements and gradually analyzes the prerequisite skills needed to meet these requirements, providing a basis for assessing instructional purposes. Closely related to task analysis is the development of theories and methods for behavioral objectives, as the purpose of task analysis is to establish clear and specific behavioral objectives (Huang, 2015). The introduction of behavioral objectives further requires corresponding reforms in instructional evaluation methods.

When applying information technology to classroom instruction, the first step is to analyze the teaching objectives and, once they are clearly defined, assess the skills possessed by the students and analyze existing direct experiences. Subsequently, based on the teaching objectives, various multimedia teaching tools should be selected

and utilized to design instructional scenarios that are easily accessible to students (Guo, 2017). Following this, appropriate media elements and efficient teaching methods should be chosen for implementation. Lastly, feedback and evaluation should be conducted to address and rectify any shortcomings. This theory provides strong guidance for teachers in the process of applying information technology to instruction.

2.2 Information Technology Application Ability

Teachers' ability to apply information technology is a new requirement in today's society. With the rapid development of information technology and its continuous integration into the field of education, this basic skill is becoming increasingly prominent in teachers' overall abilities (Rao et al., 2019).

From the perspective of various aspects of education and teaching, as well as the professional development of teachers, and set five standard requirements for teachers: teachers must first have a theoretical foundation related to information technology; they should design teaching plans before class; organize and implement the teaching process; and reflect on teaching evaluations after class, and engage in self-education and professional development (Sui et al., 2020). These requirements link the development of teachers' abilities with different teaching components in the classroom. For these five components, two levels of requirements are outlined. The basic requirement is to use technology to transform teaching, which is easily achievable for most teachers. The developmental requirement, however, demands that teachers also change the way students learn (Wang & Liu, 2017). This not only requires the personal effort of the teacher but also relies on a more complete informatization environment, requiring teachers to invest time and energy to achieve this.

The information technology application ability of teachers in this study is based on the "Trial Standards" and serves as a means for teaching reform. It involves teachers' ability to integrate teaching resources, conduct teaching activities, and enrich teaching outcomes based on information technology. This is a skill that requires teachers to have strong practical abilities. Xu et al. (2020) collected data through questionnaires and semi-structured interviews, and employed grounded theory to analyze the data, thereby systematically developing a model of factors influencing rural teachers' technology application. They conducted a detailed examination of the interactions among these influencing factors. The research revealed that the main factors impacting rural teachers' technology use encompass teachers' personal traits,

technological cognition, physical environment, policy environment, and teaching environment.

2.2.1 Skill Foundation

Skill foundation primarily refers to the impact of the knowledge and skills in information technology that teachers have already mastered on their ability to apply information technology. This skill foundation encompasses both pre-service learning (acquired during their school years) and practical knowledge and skills accumulated by teachers through non-instructional activities (Pang, 2021). Influenced by environmental conditions, there are indeed differences in the skill foundation of rural primary school teachers, which in turn affects their level of information technology application ability. Skill foundation refers to teachers' basic information technology proficiency, encompassing fundamental operational capabilities in information technology and essential competencies in utilizing information technology for teaching purposes. Skill foundation refers to the essential abilities required for individuals to understand and utilize information technology. These foundation skills serve as the prerequisite for further learning and applying advanced knowledge and skills in information technology (Jiao, 2021).

The information technology application ability of rural primary school teachers is relatively weak, and they tend to have a stronger exclusivity towards information technology. Field research has found that the current acceptance of technology among rural teachers is still not high, and their basic level of information skills is limited (Li et al., 2015). Some teachers are even still at the stage of merely transferring traditional teaching methods to digital platforms, akin to moving content from a blackboard to a screen. Research has shown that the issue of teachers' skill foundation is a fundamental factor determining whether rural teachers can adopt and implement the integration of information technology into education. A teacher's ability to apply information technology can be demonstrated in educational practice. Zhang and Li (2008) conducted research on the motivation and attribution of teachers in applying information technology in teaching, concluding that the main obstacles to teachers' use of information technology were their own ability levels and the level of emphasis placed on it by schools. Based on an analysis of the development status and issues regarding teachers' information technology application abilities.

Through the adoption of coding analysis methods in open-ended interviews with rural primary and secondary school teachers, it was found that teachers' foundational skills in information technology have a direct and significant impact on their ability to

apply information technology. (Li, 2020) This is not only reflected in their proficiency in mastering and using various information technology tools but also in their ability to effectively integrate information technology into daily teaching, thereby enhancing teaching quality and effectiveness. The more extensive the skill and experience accumulation of rural primary school teachers, the greater the improvement in information technology application ability.

2.2.2 Psychological State

Psychological state refers to the internal psychological condition and emotional responses displayed by teachers during teaching and work. It includes aspects such as teachers' emotions, attitudes, beliefs, self-efficacy, and their perception and adaptation to the work environment and professional roles. This psychological state significantly impacts teachers' teaching effectiveness, their ability to apply information technology, and students' learning experiences (Li, 2014).

Kreijns (2013) argued that teachers' psychological states, such as attitudes, beliefs, and self-efficacy, influenced the utilization of digital learning materials, which subsequently impacted their use of information technology. The psychological state plays a shaping role in an individual's behavioral patterns. Among rural teachers, their psychological state when faced with information technology application reflects a deep understanding of the significance of integrating information technology with education and teaching, and manifests as a psychological tendency towards this integration.

The intrinsic psychological state of rural teachers' subjective initiative is directly related to their motivation to learn and apply information technology knowledge and skills (Tao, 2023). What attitude do teachers hold towards the effectiveness of applying information technology in classroom instruction? Do they believe it to be effective or ineffective? Are teachers able to select appropriate information technology to assist in teaching? Are they sufficiently confident in implementing information technology in the classroom? What attitude do teachers hold towards the integration of information technology and physical education?

With the continuous development of educational modernization, higher requirements and standards have been set for teachers' instruction. Teaching is no longer confined to traditional teaching modes, but rather requires innovative teaching modes (Ning & Cui, 2022). Therefore, how can traditional teaching methods be innovated? This necessitates a call for the adoption of new teaching tools, such as

incorporating modern information technology into the teaching process. To achieve this, teachers need to change their teaching concepts and enhance their understanding of information technology.

2.2.3 Teacher Training

Teacher training involves professional development programs designed to enhance teachers' overall competence and professional skills. It also aims to optimize their knowledge structure, equip them with the latest knowledge, broaden their horizons, and promote the development of physical education teachers' research capabilities (Shi, 2020). Furthermore, it enables teachers to experience greater emotional fulfillment, such as professional identity and belonging, and gain new ideological insights.

Xie et al. (2018) proposed that insufficient teacher awareness, unclear policy direction, and the formalization of training methods were the main reasons for teachers' lack of information technology skills, from both the teacher and national levels. Ifinedo's (2020) research results indicated that the factors influencing teachers' information technology application ability can be divided into two levels: external and internal. External barriers include issues such as teachers lacking access to technology and training opportunities, which may limit the improvement of their information technology application abilities. An and Zhou (2021) conducted a study using multiple linear regression analysis to investigate the main factors influencing teachers' information technology application ability. The research revealed that teachers' learning of information technology and on-the-job organizational training have significant impacts on information technology application ability.

In the career development of teachers, training is a crucial aspect for enhancing their professional qualities, especially for rural teachers. Systematic specialized training can compensate for their deficiencies in academic qualifications and professional competencies, thereby fostering their professional advancement. Teachers' digital education resource application abilities are influenced by the frequency and duration of their participation in government or school-based information technology training. By engaging in relevant training, teachers can continuously upgrade their skills and proficiency in applying digital education resources, thereby better adapting to the demands of information-based teaching. Therefore, governments and schools should strengthen information technology training for teachers, improve their digital education resource application abilities, and promote the development of education informatization.

2.2.4 Policy Support

Policy Support refers to the support and assistance provided by the government or relevant institutions through the formulation and implementation of various policies, regulations, and measures for specific sectors or groups. Kong (2017) believed that rural middle school teachers' ability to apply information technology was influenced not only by personal factors such as their own information technology skills and awareness of self-development but also by social factors such as school policies and higher-level requirements.

The impact of policies, as guidelines and plans, influences teachers' overall understanding and grasp of information technology, thereby affecting their information technology application abilities (Pang, 2021). Therefore, relevant policy support is particularly important for teachers. Policy requirements can influence teachers' judgments and choices regarding teaching methods. For instance, if the nation, region, and school prioritize information technology, teachers will also enhance their emphasis on information technology and be more willing to incorporate information technology elements into their physical education classes, conducting modernized teaching.

Kong (2017) believed that the information technology application abilities of rural junior high school teachers were influenced not only by factors related to the teachers themselves, such as their information technology skills and self-development consciousness, but also by social factors such as school policies and superior requirements. Zhang and Li (2008) conducted research on the motivation and attribution of teachers' application of information technology in teaching, concluding that the main obstacles for teachers in utilizing information technology were their own ability levels and the level of importance attached by the school. Based on the analysis of the then-current development status and exposed issues of teachers' information technology application abilities, Xie et al. (2023) proposed from the perspectives of teachers themselves and the national level that unclear policy guidance was the main reason for teachers' lack of information technology abilities.

2.3 Conceptual Framework

Based on Constructivist Learning Theory and Systematic Teaching Theory, the factors influencing rural primary school Chinese language teacher's information

technology application ability are identified: skill foundation, psychological state, teacher training, policy support. The conceptual framework is shown in Figure 2.1.

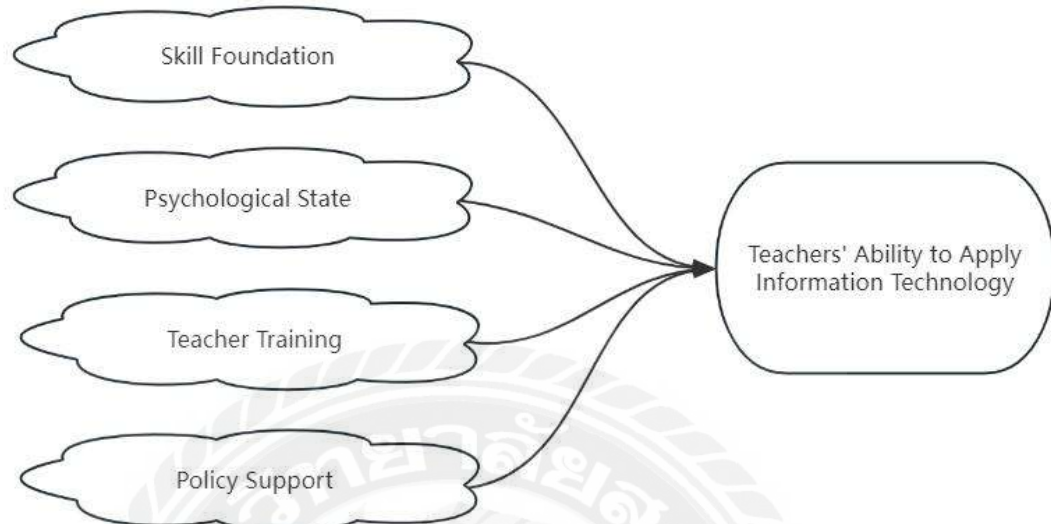


Figure 2.1 Conceptual Framework

Chapter 3 Research Methodology

3.1 Research Design

This study explored the factors influencing the information technology application ability of primary school Chinese language teachers in rural areas through a quantitative research method. To achieve this objective, the study first systematically collected, organized, and analyzed existing relevant literature. This process provided the study with a rich theoretical background and knowledge support. Based on the results of the literature review, the study identified several potential factors that may affect the information technology application ability of primary school Chinese language teachers in rural areas: skill foundation, psychological state, teacher training, and policy support.

To validate the research objectives, this study specifically designed a survey questionnaire for assessing teachers' information technology application ability, aiming to comprehensively evaluate their actual competencies in this field. Subsequently, the questionnaires were distributed online to all Chinese teachers at seven rural primary schools in Weifang City, totaling 186 participants, with the intention of collecting authentic and valid data through their feedback. Finally, this study employed SPSS to conduct correlation analysis and multiple regression analysis on the collected data, anticipating results that align with the research hypotheses.

3.2 Population and Sample

This study focused on seven rural primary schools in Weifang City, with its research subjects encompassing all Chinese language teachers in these schools, totaling 186 individuals. These Chinese language teachers are not only the backbone of the rural education system but also crucial ambassadors for transmitting and promoting Chinese culture. In the current era of informatization, their proficiency in applying information technology not only impacts their personal career development but also holds paramount significance in enhancing the quality of rural education and narrowing the gap between urban and rural educational disparities.

3.3 Hypothesis

This study first identified the key influencing factors of rural teachers'

information technology application competence through a literature review. Subsequently, it utilized structural equation modeling to quantify and conduct confirmatory research on the influence relationships among these factors, aiming to explore the underlying correlations between these variables and rural teachers' information technology application competence. This study proposes the following research hypotheses:

H₁: Skill foundation has a significant impact on the information technology application ability of primary school Chinese language teachers in rural areas.

H₂: Psychological state has a significant impact on the information technology application ability of primary school Chinese language teachers in rural areas.

H₃: Teacher training has a significant impact on the information technology application ability of primary school Chinese language teachers in rural areas

H₄: Policy support has a significant impact on the information technology application ability of primary school Chinese language teachers in rural areas.

3.4 Research Instrument

This study, based on the previously identified constituent elements of rural teachers' information technology application competence, identified teacher four specific components: skill foundation, psychological state, teacher training, and policy support. In order to quantitatively analyze these influencing factors, this study referred to existing mature questionnaires and made appropriate adaptations to design a scale suitable for this study. The questionnaire of this study is mainly divided into two parts, totaling 28 items:

The first part collects basic information about teachers, including their gender, age, years of teaching, and the grade level they teach. This information helps to understand the background characteristics of the respondents. The second part is the main body of the questionnaire, which is specifically designed for the influencing factors of rural teachers' information technology application competence to gain a more objective and realistic understanding of the current application status. This part is compiled using the Likert five-point scale, namely "completely disagree," "disagree," "neutral," "agree," and "completely agree."

3.4.1 Skill Foundation Scale

Skill foundation primarily refers to teachers' proficiency in information

technology, encompassing both basic operational capabilities in IT and foundational skills for integrating IT into teaching. Skill foundation is a critical factor in the development of teachers' information technology capabilities. Pang (2021) found that rural teachers with weaker skill foundations exhibit higher levels of technological anxiety and lower willingness to adopt IT. In contrast, teachers with solid skill foundations adapt more quickly to technological changes and actively explore ways to integrate IT into their teaching practices.

The skill foundation items used in this study were adapted from Yi's (2021) questionnaire on the evaluation of information-based teaching capabilities of primary and secondary school teachers. It consists of six items as shown in Table 3.1.

Table 3.1 Skill Foundation Scale

Skill Foundation Scale	
1	I am proficient in using school equipment such as electronic whiteboards, integrated machines, and projectors.
2	I am familiar with using tools like Baidu, smartphones, and tablets.
3	I can search for and download teaching materials from the internet.
4	I am capable of editing and utilizing downloaded teaching materials.
5	I can use online education platforms to support teaching.
6	I am able to troubleshoot basic issues with equipment such as electronic whiteboards, integrated machines, and projectors.

3.4.2 Psychological State Scale

Teachers' psychological state specifically encompasses their attitudes toward information technology, their motivation for using it, their teaching philosophies and educational beliefs in the context of teaching, as well as their sense of self-efficacy. However, rural teachers face many challenges in applying information technology, and their psychological state has been widely recognized as a significant factor influencing their ability to use IT effectively. Zhao and Miao (2019) found that rural teachers who believe that information technology can enhance teaching effectiveness are more willing to adopt these technologies.

The teacher psychological state scale used in this study was adapted from the Information Technology Application Ability Improvement Questionnaire by Sun and

Han (2022), consisting of 6 items as shown in Table 3.2.

Table 3.2 Psychological State Scale

Psychological State Scale	
7	I believe that information technology can enhance teaching effectiveness.
8	I am willing to use information technology to improve classroom teaching (such as sound, images, etc.).
9	I frequently use one or more types of information technology to enrich classroom teaching (such as videos, animations, etc.).
10	I am confident in using appropriate information technology in classroom teaching (such as multimedia presentations, videos, etc.).
11	I am willing to use information technology to increase students' interest in learning and their engagement.
12	I believe that information technology can help students better understand and master the course content.

3.4.3 Teacher Training Scale

Teacher training primarily refers to the information technology training that teachers receive, including training organized according to national or regional plans, as well as training on information technology application abilities within the school. Zhao (2018) found that through effective training, rural teachers are able to overcome technological anxiety, gradually build confidence, and thus improve their ability to apply information technology.

The teaching training scale used in this study was adapted from the questionnaire by Li and Du (2018), consisting of 7 items.

Table 3.3 Teacher Training Scale

Teacher Training Scale	
13	My school organizes seminars on the integration of information technology and teaching.
14	The schedule of the recent information technology training course I attended was reasonable, allowing me ample time to learn and apply the content.
15	The training I recently attended provided comprehensive support services, such as course consultations and assessments.
16	I am able to apply what I learned from the information technology training to my teaching.

- 17 I believe information technology training helps me better address challenges in classroom teaching.
 - 18 The content of the information technology training I attended was practical and can be directly applied to my teaching practice.
-

3.4.4 Policy Support Scale

Policy support mainly refers to national and local policies, as well as the development plans of schools, including specific policies for rural primary and secondary school teachers, such as calls to improve rural teachers' salaries and benefits (Yan et al., 2019). It also includes a series of systems related to capacity development, such as whether reward and punishment measures are in place or whether incentive policies exist. It influences teachers' ability to apply information technology to some extent. The scale consists of 6 items as shown in Table 3.4.

Table 3.4 Policy Support Scale

Policy Support Scale	
19	My school includes teachers' information technology application abilities in the teacher evaluation system, which can improve my ability to apply information technology.
20	The school's teaching schedule allows me time to learn information technology.
21	Local competitions for teachers' information technology application abilities can enhance my skills in using information technology.
22	The implementation of national policies supporting information technology for rural teachers enables me to better integrate information technology into my teaching.

3.4.5 Teachers' Ability to Apply Information Technology

Teachers not only need to recognize the importance of information technology and acquire knowledge about its application, but more importantly, they must learn how to use it more efficiently in teaching activities and their own professional development (Zhang et al., 2017). Application ability is continuously improved and refined through teaching practice. The level of a teacher's ability to apply information technology significantly impacts teaching quality and student learning outcomes. Therefore, understanding teachers' application abilities is essential. The scale consists of 6 items as shown in Table 3.5.

Table 3.5 Teachers' Ability to Apply Information Technology Scale

Teachers' Ability to Apply Information Technology Scale	
23	The technical support services provided by the school can promptly address issues encountered in the use of information technology.
24	Students have a high level of acceptance towards the application of information technology in the Chinese language classroom.
25	I frequently collaborate with teachers from other subjects to explore how to apply information technology in interdisciplinary teaching.
26	I have sufficient opportunities to discuss and share experiences regarding the application of information technology in teaching with my colleagues.
27	My work schedule allows me ample time to learn and apply information technology.
28	The teaching environment I am in promotes the effective integration of information technology into classroom teaching.

3.5 Reliability and Validity Analysis of the Scale

3.5.1 Questionnaire Reliability Analysis

Reliability reflects the stability or internal consistency of a scale. According to the views of several experts, the optimal value for Cronbach's α coefficient is 0.7 or higher. If the Cronbach's α coefficient is below 0.7, it indicates relatively poor internal consistency among the items within the scale, suggesting the need for appropriate adjustments or revisions to the scale.

Table 3.6 Reliability Analysis Results

Scale	N	Cronbach's α
Skill foundation scale	6	0.830
Psychological state scale	6	0.817
Teacher training scale	7	0.782
Policy support scale	6	0.843
Teachers' ability to apply information technology scale	6	0.771

In Table 3.6, the Cronbach's α coefficients for the various dimensions of the scale range from 0.771 to 0.843, indicating a high level of internal consistency across the components of the survey on teachers' information technology application ability.

3.5.2 Questionnaire Validity Analysis

Validity is the standard for assessing the accuracy or effectiveness of a scale,

reflecting the extent to which the scale accurately measures the intended construct. Higher validity indicates that the scale can more precisely capture the target. In this study, the KMO value and the significance level of Bartlett's test of sphericity are used as evaluation criteria to assess the structural validity of the questionnaire. Generally, if the KMO value exceeds 0.7 and the significance level of Bartlett's test meets the required threshold (Sig. < 0.01), it indicates that the questionnaire has a high level of structural validity.

Table 3.7 Validity Analysis Results
The KMO Values and the Bartlett's Sphericity Test

Number of KMO Sampling Suitability Quantities		0.842
The Sphericity Test of the Bartlett	Approximate	3047.064
	chi-square	
	df	279
	Sig.	0.000

In Table 3.7, the validity test results for the survey questionnaire show that the KMO value is 0.842, exceeding the standard threshold of 0.7. Additionally, Bartlett's test of sphericity is highly significant (Sig. = 0 < 0.01), indicating that the structural validity of the scale meets the required standards.

3.6 Data Collection

This study utilized WeChat to distribute questionnaires online. During the survey, rural teachers participating in the investigation were required to fill out the questionnaire based on their true situations. A total of 186 questionnaires were distributed and collected. After eliminating invalid questionnaires with missing information and those where all answers were the same, 180 valid questionnaires were ultimately obtained, resulting in a 96.7% response rate.

3.7 Data Analysis

This study first conducted reliability and validity tests to confirm the effectiveness of the survey questionnaire. When analyzing the validity and reliability of the survey, the tool utilized was SPSS software. After completing the reliability and validity tests, further correlation analysis and multiple regression analysis were conducted to deeply explore the internal connections and patterns between various

influencing factors and rural teachers' information technology application competence.



Chapter 4 Findings

4.1 Introduction

This study used three analytical methods: descriptive analysis, correlation analysis, and multiple regression analysis to systematically and comprehensively examine the research data. First, descriptive analysis was used to summarize and characterize the basic features of the sample data, providing a foundational understanding and preliminary insights for subsequent analyses. Second, correlation analysis was applied to explore the relationships among variables, assessing the strength and direction of these associations as initial support for hypothesis testing. Finally, multiple regression analysis was conducted to further investigate the effects of independent variables on the dependent variable. By controlling for other factors, this approach examined the significance and robustness of the hypotheses, thereby uncovering the mechanisms of influencing factors and providing solid empirical evidence for the study's conclusions.

4.2 Demographic Characteristics of Respondents

Table 4.1 Demographic Analysis Results

Items	Category	Number of Teachers	Percentage (%)
Gender	Male	66	36.6
	Female	114	63.4
Age	Below 25 years old	31	16.8
	26-35 years old	56	31.1
	36-45 years old	69	38.8
	Over 46 years old	24	13.3
Years of teaching	1-5 years	38	21.1
	6-10 years	52	28.8
	11-20 years	63	35.0
	Over 21 years	27	15.1
Grade level of teaching	Grade 1	26	14.4
	Grade 2	25	13.8
	Grade 3	32	17.7
	Grade 4	30	16.6
	Grade 5	35	19.4
	Grade 6	32	18.1
Total		180	100

The sample characteristics are shown in the Table 4.1. In terms of gender, female respondents accounted for 63.4%, while male respondents made up 36.6%. This aligns with the higher proportion of female teachers in basic education, accurately reflecting the actual situation of the research subjects.

Regarding age, teachers aged 30-40 formed the majority, accounting for 38.8%, followed by those aged 25-35 at 31.1%. Together, these two groups comprised over 69.9% of the sample, representing the current age structure of rural teachers, which is predominantly middle-aged and young. Teachers aged 46 and above accounted for 13.3%, indicating that the rural teaching workforce is gradually trending younger.

In terms of teaching experience, the majority of respondents had 11-20 years (35%) or 6-10 years (28.8%) of teaching experience. This distribution aligns with the age structure, reflecting a mix of seasoned teachers with extensive experience and newer teachers with less experience. Notably, 21.1% of respondents had 1-5 years of teaching experience, further demonstrating the trend toward a younger teaching workforce.

The grade levels of teaching were relatively evenly distributed.

Overall, the sample of this survey accurately represents the actual characteristics of rural primary school Chinese language teachers, demonstrating strong representativeness.

4.3 Correlation Analysis

Table 4.2 Correlation Analysis Results

Item	SF	TPS	TT	PS	TAAIT
SF	1				
TPS	0.621**	1			
TT	0.532**	0.496**	1		
PS	0.565**	0.517**	0.523**	1	
TAAIT	0.514**	0.475**	0.501**	0.479**	1

Notes: Skill Foundation means SF;

Psychological State means TPS;

Teacher Training means TT;
Policy Support means PS;
Teachers' Ability to Apply Information Technology means TAAIT.

The relationships between rural primary school teachers' ability to apply information technology and various influencing factors are as follows:

The correlation coefficient between teachers' ability to apply information technology and skill foundation is 0.514, significant at the 0.01 level. This indicates a significant positive correlation between teachers' ability to apply information technology and skill foundation.

The correlation coefficient between teachers' ability to apply information technology and psychological state is 0.475, significant at the 0.01 level. This suggests a significant positive correlation between teachers' ability to apply information technology and psychological state.

The correlation coefficient between teachers' ability to apply information technology and teacher training is 0.501, significant at the 0.01 level. This demonstrates a significant positive correlation between teachers' ability to apply information technology and teacher training.

The correlation coefficient between teachers' ability to apply information technology and policy support is 0.479, significant at the 0.01 level. This reflects a significant positive correlation between teachers' ability to apply information technology and policy support.

4.4 Multiple Regression Analysis

Table 4.3 Multiple Regression Analysis Results

	Non-Standardized Coefficient	Standard Error	Standardize d coefficient	t	Sig.	VIF
	B		Beta			
(Constant)	3.176	0.921	-	6.314	0.000	
SF	0.314	0.273	0.215	4.374	0.012	1.231
TPS	0.277	0.359	0.243	2.846	0.006	1.197
TT	0.412	0.238	0.374	4,575	0.009	1.194
PS	0.382	0.376	0.461	5.438	0.016	1.212
R ²			0.513			
Adjusting R ²			0.522			
F			89.372**			
DW			1.743			
H ₁			Supported			
H ₂			Supported			
H ₃			Supported			
H ₄			Supported			

Notes: Skill Foundation means SF;
 Psychological State means TPS;
 Teacher Training means TT;
 Policy Support means PS;
 Teachers' Ability to Apply Information Technology means TAAIT.

In Table 4.3, The R² value of the model is 0.513, and the adjusted R² value is 0.522, indicating that the independent variables explain 52.2% of the variance in the dependent variable. The overall regression model is significant, with F=89.372, p<0.01. The Durbin-Watson statistic is 1.743, suggesting that there is no severe autocorrelation in the regression model.

For skill foundation, the unstandardized regression coefficient is B=0.314, with a standard error of 0.273. The standardized regression coefficient is β =0.215, t=4.374, p=0.012, indicating that skill foundation has a significant positive effect on teachers' ability to apply information technology. H₁ is supported.

For psychological state, the unstandardized regression coefficient is B=0.277, with a standard error of 0.359. The standardized regression coefficient is β =0.243, t=2.846, p=0.006, suggesting that psychological state has a significant positive effect on teachers' ability to apply information technology. H₂ is supported.

For teacher training, the unstandardized regression coefficient is B=0.412, with a

standard error of 0.238. The standardized regression coefficient is $\beta=0.374$, $t=4.575$, $p=0.009$, suggesting that teacher training has a significant positive effect on teachers' ability to apply information technology. H_3 is supported.

For policy support, the unstandardized regression coefficient is $B=0.382$, with a standard error of 0.359. The standardized regression coefficient is $\beta=0.461$, $t=5.438$, $p=0.016$, suggesting that policy support has a significant positive effect on teachers' ability to apply information technology. H_4 is supported.

The variance inflation factor (VIF) for all variables is less than 10 (the highest being 1.231), suggesting that there is no severe multicollinearity problem in the model.



Chapter 5 Conclusion and Recommendation

5.1 Conclusion

5.1.1 Skill Foundation Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology

The data analysis results show that the skill foundation has a significant positive impact on the information technology application ability of rural primary school Chinese language teachers.

The skill foundation primarily refers to the basic knowledge and ability reserve of teachers in applying information technology, including their technical operation skills and understanding and usage of information technology tools. The skill foundation is the prerequisite and basis for improving information technology application skills. A solid skill foundation enables teachers to better master and utilize information technology, thereby enhancing teaching efficiency and quality. In today's society, the skill foundation is crucial for teachers' professional development. Only with a strong skill foundation can teachers keep up with the pace of technological advancement in the constantly changing educational environment.

5.1.2 Psychological State Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology

The data analysis results show that psychological factors have a significant positive impact on the information technology application ability of rural primary school Chinese language teachers. Psychological factors mainly include teaching beliefs, self-efficacy, motivation, and attitudes, all of which significantly influence the information technology application ability of teachers during their instruction.

Internal factors such as self-efficacy, psychological motivation, attitude, and teaching beliefs affect the behavior and actions of individuals. As intrinsic drivers of behavior, these factors motivate individuals to continuously move toward a specific goal. Among these, the mutual evaluation of abilities within the teacher group and individual self-assessment influence teachers' teaching beliefs and ideas, which, in turn, affect their information technology application skills. Therefore, it is important to focus on the psychological development of teachers and promote a positive psychological outlook.

5.1.3 Teacher Training Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology

The data analysis results show that teacher training has a significant positive impact on the information technology application ability of rural primary school Chinese language teachers. Through teacher training, the development of teachers' information technology application ability can be further enhanced.

In the context of educational modernization, teachers should maintain a lifelong learning attitude, continuously learning and improving. Therefore, various training programs need to be strengthened. The information technology application skills of teachers are closely linked to teacher training. Teachers' learning methods are no longer singular but are becoming more diversified. Teacher training provides convenience, offering both online and offline options, allowing teachers to access more information and knowledge through diverse channels. Most teacher training is conducted collectively, supported by schools, which greatly enhances teachers' teaching abilities, provides targeted development, and promotes the rapid advancement of teachers' information technology application ability.

5.1.4 Policy Support Has a Significant Impact on Chinese Language Teachers' Ability to Apply Information Technology

The data analysis results show that policy support has a significant positive impact on the information technology application ability of rural primary school Chinese language teachers.

Policy support refers to the influence of relevant support policies enacted by the government, regions, and schools to enhance teachers' information technology application ability. In recent years, the government, regional authorities, and schools at all levels have continuously improved relevant policies, advancing national strategies for educational modernization and the development of national information technology. This includes the implementation of the New Era Basic Education Strong Teacher Program and requirements to strengthen and improve school physical education. Through strategic development requirements, the implementation of related policies, and the provision of basic policy support, these efforts further promote the development of primary school teachers' information technology application ability.

5.2 Recommendation

5.2.1 Integrate Theory with Practice

Although educational modernization is continuously strengthening and developing, many rural elementary school Chinese language teachers still lack awareness of information technology. Therefore, relevant departments and schools at all levels should take a comprehensive approach by providing online or offline materials related to information technology application abilities for Chinese language teachers. These efforts should be tailored to local characteristics and strengthen publicity to create an atmosphere of educational modernization on campus. This will help teachers consistently experience the development of information technology application abilities in their daily work, appreciate the convenience of technology, and be deeply influenced, thereby enhancing their awareness of information technology application abilities. At the same time, teachers primarily work within the school, where schools can focus on both theoretical and practical efforts.

Firstly, in theory, schools should organize and conduct sessions to promote policies, laws, and regulations related to information technology application abilities, strengthening theoretical learning.

Secondly, in practice, schools should provide more opportunities for teachers to gain practical experience, such as through specialized lectures and continuing education programs. This will help shift teachers' mindset, raise their awareness of the importance of information technology application abilities, and promote the enhancement of their professional competencies. By keeping teachers updated with new information and reinforcing updated teaching concepts, schools can encourage teachers to integrate information technology elements into their teaching, thereby improving the implementation of teaching and enhancing information technology application abilities in the classroom.

5.2.2 Establish the Training Mechanism and Evaluation System

Develop practical and feasible training programs for physical education teachers, assigning specialized trainers for one-on-one, targeted instruction. Relevant departments and schools at all levels should design training content based on specific needs, standardize requirements that meet teachers' needs, and establish reasonable assessment criteria. Professional training teams should be formed, and schools should maintain timely communication with trainers to analyze the progress of teacher training. Training schedules should be thoughtfully arranged. During the training

process, trainers should understand the real needs of teachers, while teachers should be introduced to the latest information technology, thereby enhancing their information technology application abilities.

Establish a reasonable performance assessment system. To determine whether teachers' information technology application abilities have improved, a corresponding evaluation system is needed. Only with a complete assessment system can the information technology application abilities of physical education teachers be effectively evaluated. The assessment should consider a comprehensive and holistic approach. Additionally, the evaluation of teachers' information technology application abilities should be linked to teacher hiring, awards, promotions, and other factors. It should also be incorporated into the requirements for obtaining teaching qualifications, thereby encouraging teachers to continuously improve themselves.

5.2.3 Improve the Software and Hardware Infrastructure of School

Improving the software and hardware infrastructure of schools is essential for enhancing information technology application. Strengthening the construction of basic infrastructure should be a key focus. At the same time, schools need to "increase revenue and reduce expenditure" to ensure the sustainable development of teachers' information technology application abilities. "Increasing revenue" refers to the development of Chinese language information resources. Schools can establish dedicated websites and create information exchange platforms to promote resource sharing. "Reducing expenditure" means enabling teachers to flexibly utilize information resources, learn to use limited resources for efficient teaching, innovate traditional teaching methods, and achieve the scientific development of educational modernization.

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Appendix

Dear Teacher,

Greetings! First and foremost, thank you for taking the time to complete this questionnaire amidst your busy schedule. To better understand the information technology application skills of rural Chinese language teachers and to effectively enhance these skills, we sincerely invite you to participate in this survey.

This questionnaire is anonymous, and the results will be used solely for data analysis in this study. Rest assured that your responses will not have any adverse effects on you or your school. There are no right or wrong answers, nor good or bad choices; every response you provide is crucial to the study's outcomes.

I kindly ask for your honest and thoughtful answers. Thank you for your valuable assistance. Wishing you success in your work and happiness in life!

1. Basic information

- 1) Your gender:
☐ Male ☐ Female
- 2) Your age:
☐ Below 25 years old ☐ 26-35 years old
☐ 36-45 years old ☐ Over 46 years old
- 3) Years of teaching:
☐ 1-5 years ☐ 6-10 years
☐ 11-20 years ☐ Over 21 years
- 4) The grade level you teach
☐ Grade 1 ☐ Grade 2 ☐ Grade 3
☐ Grade 4 ☐ Grade 5 ☐ Grade 6

2. Survey on the Current Status of Information Technology Application Ability

- 1 means completely disagree;
- 2 means disagree;
- 3 means neutral;
- 4 means agree;
- 5 means completely agree.

Skill Foundation Scale		1	2	3	4	5
1	I am proficient in using school equipment such as electronic whiteboards, integrated machines, and projectors.					
2	I am familiar with using tools like Baidu, smartphones, and tablets.					
3	I can search for and download teaching materials from the internet.					
4	I am capable of editing and utilizing downloaded teaching materials.					
5	I can use online education platforms to support teaching.					
6	I am able to troubleshoot basic issues with equipment such as electronic whiteboards, integrated machines, and projectors.					
Teachers' Psychological State Scale		1	2	3	4	5
7	I believe that information technology can enhance teaching effectiveness.					
8	I am willing to use information technology to improve classroom teaching (such as sound, images, etc.).					
9	I frequently use one or more types of information technology to enrich classroom teaching (such as videos, animations, etc.).					
10	I am confident in using appropriate information technology in classroom teaching (such as multimedia presentations, videos, etc.).					
11	I am willing to use information technology to increase students' interest in learning and their engagement.					
12	I believe that information technology can help students better understand and master the course content.					
Teaching Training Scale		1	2	3	4	5
13	My school organizes seminars on the integration of information technology and teaching.					
14	The schedule of the recent information technology training course I attended was reasonable, allowing me ample time to learn and apply the content.					
15	The training I recently attended provided					

comprehensive support services, such as course consultations and assessments.					
16 I am able to apply what I learned from the information technology training to my teaching.					
17 I believe information technology training helps me better address challenges in classroom teaching.					
18 The content of the information technology training I attended was practical and can be directly applied to my teaching practice.					
Policy Support Scale	1	2	3	4	5
19 My school includes teachers' information technology application abilities in the teacher evaluation system, which can improve my ability to apply information technology.					
20 The school's teaching schedule allows me time to learn information technology.					
21 Local competitions for teachers' information technology application abilities can enhance my skills in using information technology.					
22 The implementation of national policies supporting information technology for rural teachers enables me to better integrate information technology into my teaching.					
Teachers' Ability to Apply Information Technology Scale	1	2	3	4	5
23 The technical support services provided by the school can promptly address issues encountered in the use of information technology.					
24 Students have a high level of acceptance towards the application of information technology in the Chinese language classroom.					
25 I frequently collaborate with teachers from other subjects to explore how to apply information technology in interdisciplinary teaching.					
26 I have sufficient opportunities to discuss and share experiences regarding the application of information technology in teaching with my colleagues.					
27 My work schedule allows me ample time to learn and apply information technology.					

28 The teaching environment I am in promotes the effective integration of information technology into classroom teaching.

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