THE INFLUENCE OF PRINCIPALS' INFORMATION TECHNOLOGY LEADERSHIP ON TEACHERS' INFORMATION TECHNOLOGY APPLICATION ABILITY OF RURAL SCHOOL IN PU'ER CITY YUNNAN PROVINCE CHINA

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Abstract

The research aims: 1) To study rural primary and secondary school principals in Pu'er City, providing empirical references for rural education informatization theories. It broadens the scope of existing education informatization studies and enriches current research on educational leadership theories. 2) Primary and secondary school principals, as leading figures in rural education, are the key subjects to study. This study analyzes the influencing factors of their informatization leadership in Pu'er City. To some extent, it provides theoretical support for education - related administrative departments to accurately evaluate rural principals' informatization leadership level and formulate improvement policies. 3) Study, investigate and analyze the current state of information leadership among rural primary and secondary school principals in Pu'er City, identify issues, and propose strategies to enhance their information leadership capabilities. It has significant practical implications: 4) Studying can prompt rural primary and secondary school principals in Pu'er city to rethink educational informatization work and accelerate the informatization process in Pu'er area.

Keywords: Contingency Leadership, Psychological Adaptability, Vocational Education, Foreign Affairs & Foreign Language.

Introduction

With the deepening advancement of China's educational informatization and the increasingly close integration of computer technology with teaching practices, systematically and professionally cultivating the digital literacy of primary and secondary school principals has become a critical mission in current educational development, directly impacting the realization of national education modernization goals. Tracing policy developments, as early as 2014, the Ministry of Education demonstrated forward-looking strategic vision by establishing clear requirements for principals' digital leadership responsibilities in policy documents such as the "Information Technology Application Competency Standards for Primary and Secondary School Teachers (Trial)", while simultaneously developing corresponding evaluation criteria. This provided guidance and established an operational framework for principals to lead school informatization. Subsequently, the 2018 "Education Informatization 2.0 Action Plan" further emphasized that the focus of educational development had shifted from infrastructure construction to deepening application integration, advocating for genuine fusion between education and information technology. This transformation would catalyze innovative teaching models and management frameworks, becoming the core driver of educational modernization. By 2019, national-level guidelines including "China Education Modernization 2035" and its implementation plans reinforced the core objectives of building intelligent campus environments, exploring smart education models, and establishing efficient digital resource sharing systems—responsibilities and missions that every principal must undertake in this new era. This demonstrates that conducting in-depth research on how to

scientifically and effectively enhance principals' capabilities in digital planning, management, and leadership—thereby driving educational information toward higher levels and deeper development—not only aligns with the inherent requirements of systematic transformation in education during the digital era, but also resonates with both the national innovation-driven development strategy and the inevitable trends of social progress.

However, substantial empirical research clearly demonstrates that the current state of digital infrastructure in most rural Chinese primary and secondary schools remains significantly underdeveloped, lagging far behind urban counterparts. These institutions urgently require substantive improvements and systematic upgrades across multiple critical dimensions: 1) Insufficient funding for digital initiatives with poor sustainability; 2) Deficiencies in campus infrastructure (including network coverage, terminal devices, and interactive classrooms); 3) Low adoption rates or inactive use of existing educational management systems; 4) Uneven regional distribution of quality digital resources with inadequate school-level allocation; 5) Superficial application of IT in teaching and administration with limited diversity; 6) Slow development of teachers 'and administrators' digital competencies coupled with ineffective training programs; 7) Lack of professional IT maintenance personnel and core faculty with adequate digital literacy; 8) Insufficient strategic planning, organizational leadership, and innovation capabilities among principals. These intertwined factors collectively pose major obstacles to sustainable digital development and efficiency enhancement in rural schools. In this context, principals—as key leaders, decision-makers, and primary responsible parties for digital transformation—exhibit critical influence through their digital literacy levels, leadership awareness, and practical implementation capabilities. Their performance directly determines the top-level design, resource allocation, and implementation outcomes of school digitalization efforts. As Zoya Charter, a senior educational technology expert at Intel Corporation, emphasizes: When principals can scientifically assess school conditions based on local educational needs, national and regional policy orientations, and the specific demands of teachers and students, while accurately identifying development directions and designing forward-looking, actionable digital transformation plans that align with institutional realities, these plans gain solid implementation foundations and internal momentum. This approach effectively builds consensus and drives digital transformation in schools. This demonstrates that principals' exceptional leadership in digitalization serves as the core engine and pivotal support for overcoming challenges in rural school digitalization and ensuring smooth, efficient development.

Therefore, driven by these pressing practical needs and robust theoretical foundations, this study focuses on rural primary and secondary schools in Pu 'er City, Yunnan Province. Through comprehensive research methods including in-depth questionnaires, structured interviews, and multi-round field observations, we systematically analyze the current status, structural challenges, and underlying factors (such as individual characteristics, school environment, regional support) of digital leadership capabilities across dimensions like cognition, planning, application, evaluation, and cultural development. The research aims to establish practical cultivation models, sustainable improvement pathways, and effective support strategies tailored for rural education realities. These findings are expected to directly advance educational informatization practices and policy optimization in Lianjiang City's rural areas, providing empirical evidence for designing regional principal training programs. Ultimately, empowering principals as key stakeholders will drive comprehensive quality enhancement and connotative development in local rural education, while offering replicable solutions and

practical wisdom to address deep-seated challenges in China's vast rural regions regarding educational information.

Research Objectives

1) To study focuses on primary and secondary school principals in rural areas of Pu'er City, providing empirical references for enriching and developing theories on rural education informatization. It contributes to broadening the research scope of existing education informatization studies and enriching current research on educational leadership theories.

2) To study As leading figures in rural education, primary and secondary school principals are the key subjects of this study, which analyzes the influencing factors of their informatization leadership in Pu'er City. To some extent, this research offers theoretical support for education-related administrative departments to accurately assess the level of informatization leadership among rural principals and formulate policies to enhance it.

3) To studyTinvestigates and analyzes the current state of information leadership among rural primary and secondary school principals in Pu'er City, identifies existing issues, and proposes practical and effective strategies to enhance their information leadership capabilities. It holds significant practical implications, as detailed below:1. The results and conclusions of this study can provide reference for the education authorities in Pu 'er to strengthen the construction of information leadership of rural principals in their region.

4) To study This study can promote the principals of rural primary and secondary schools in Pu 'er city to further think and re-understand the work of educational information, so as to accelerate the information process of primary and secondary schools in Pu' er area; the countermeasures and suggestions put forward can provide reference for the areas with similar educational information status.

Conceptual Framework

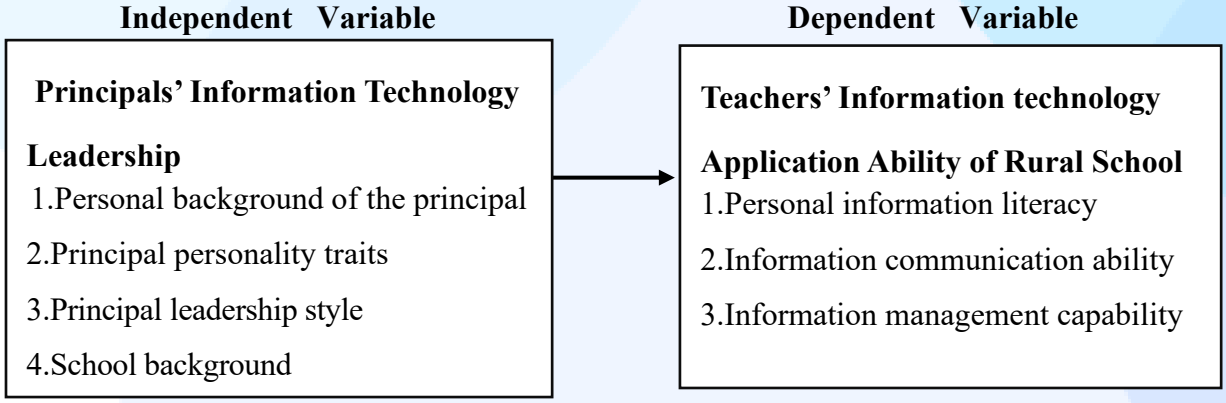

Figure 1 Conceptual Framework Diagram

Hypotheses

H1: The information literacy of principals has a significant positive impact on their information leadership

H2: The principal's information communication ability has a significant positive impact on his/her information leadership

H3: The principal's information planning ability has a significant positive impact on his/her information leadership

H4: The principal's information construction ability has a significant positive impact on his/her information leadership

H5: The principal's information management ability has a significant positive impact on his/her information leadership

H6: The principal's information evaluation ability has a significant positive impact on his/her information leadership

H7: The construction of principals' information vision and innovation ability have a significant positive impact on their information leadership

Literature Review

1. Principal's information leadership

Principal's digital leadership represents a new dimension of leadership in the digital age, encompassing both emerging competencies and evolving challenges in educational administration. Yang Kun (2014) defines it as "the ability to guide teams in fully utilizing all available digital resources to achieve organizational objectives" [35]. Zhao Leilei (2017), considering contemporary developments, characterizes this leadership as a hybrid capability that combines principals' information literacy, technical proficiency, and general leadership skills. This integrated approach emphasizes principals leveraging their digital expertise to influence stakeholders' decision-making in school planning, management, and evaluation processes[22]. Essentially, digital leadership combines external presentation with internal competencies, including political awareness, cultural sensitivity, and ethical values. Therefore, this study posits that digital leadership constitutes a comprehensive skill set where principals collaborate through team-building initiatives and shared visions for digital transformation, thereby influencing stakeholders and collectively advancing educational modernization.

2. Principal leadership

Sun Zhenxiang, Guo Xuling, and others define principal leadership as a rallying force, where principals leverage their professional expertise and ethical influence to inspire all faculty and students in achieving institutional goals. Mr.He Lefan categorizes principal leadership into five functional roles: representing the institution, guiding direction, organizing resources, coordinating efforts, and educating staff. Drawing on previous research findings, this study posits that principal leadership refers to the comprehensive ability of school administrators to plan educational visions based on their holistic competencies, thereby attracting and influencing all members of the school community—including teachers, students, staff, and stakeholders—to work collaboratively and mutually reinforce each other's progress toward realizing educational development objectives.

3.Leadership

Throughout history, wherever people exist, leaders have been essential. Mao Zedong once said that leadership involves two key tasks: first, generating sound strategies, and second, utilizing competent personnel effectively. The term "generating strategies" refers to making forward-looking policy judgments and decisions, while "utilizing competent personnel" means identifying and employing capable individuals to achieve objectives. Mao's perspectives on strategic judgment, decision-making, and talent management collectively define leadership's essence from a leader's responsibility standpoint. James Kouzes and Barry Posner, however, propose a managerial perspective where leadership is defined as the ability to inspire team members' initiative, motivating them to strive for goals and deliver exceptional results[. O 'Neill argues that leadership invlves leveraging influence to help others accomplish challenging tasks. Scholars generally agree that leadership encompasses three core elements:

It is a social process that influences others;

A leader's personality profoundly shapes their leadership style;

Leadership contexts significantly impact performance[37]. In conclusion, this study posits that leadership is the capacity of leaders within specific organizations to harness organizational talents, attract and influence followers and stakeholders, foster mutual progress, and ultimately achieve organizational goals and visions.

4.Transformation leader theory

The Transformative Learning Theory was developed by Mezirow in 1975 as a study to address the needs of women returning to university. Professor Mezirow and his research team first explicitly proposed the concept of transformative learning through their "Personal Transformation" (personal) study with several female participants. After its inception, Professor Mezirow continued promoting this theory, earning recognition as its founder. Through decades of in-depth research and expansion, the theory has been widely applied in adult education. It emphasizes that learners habitually apply acquired knowledge and experiences to interpret external phenomena, often making judgments about new insights using existing cognitive frameworks. Therefore, transformative learning refers to guiding learners to critically reflect when encountering new environments or situations, breaking down barriers within old cognitive systems, embracing new elements, and continuously building open, inclusive cognitive frameworks that guide personal behavior. In other words, transformative learning is a process of continually refining learners 'existing knowledge systems to form new understanding. The theory originated from Mezirow's 1975 study aimed at addressing the needs of returning university women. Through their "Personal Transformation" research with female participants, Professor Mezirow and his team first formally introduced the concept of transformative learning. After the theory was born, Professor Macchiola continued to promote it and became hailed as the founder learning theory emphasizes that learners habitually apply previously acquired knowledge and experiences to interpret external people and events, and use their existing cognitive frameworks to judge new insights. Therefore, transformational learning refers to guiding learners to engage in critical reflection when facing new environments and phenomena, breaking down barriers within old cognitive systems, embracing new elements, and continuously building an open, inclusive new cognitive framework that guides personal behavior. In other words, transformational learning is a process of constantly revising learners 'existing knowledge and experience systems to form new cognition. This theory holds significant implications for enhancing principals' digital leadership. The development of digital leadership requires breaking free from constraints and obstacles imposed by entrenched perceptions and patterns. Improving digital leadership involves a gradual process of questioning, dialogue, learning from others, and innovation. Confronted with the new context and tasks of educational informatization, principals need to question: Does digitalization have decisive influence? If so, how should we address this impact? What planning and design should schools undertake? With these questions in mind, principals actively seek answers, which leads to the rational dialogue phase. Principal's initiative requires communication with experts and peers. In the communication, they can often break through their own thinking limitations and gain new inspiration or even new ideas.

Research Methodology

Population and Sample

This study selected principals and full-time vice-principals from rural primary and secondary schools in Pu 'er, Yunnan Province as research subjects. With support from the

Education Informatization Office of Pu' er City Teacher Development Center, online questionnaires were distributed through Questionnaire Star in the principals' professional exchange group for data collection. As shown in Table 2-1, after excluding all invalid responses, the project utilized SPSS20.0 to conduct statistical analysis on valid questionnaires.

The sample characteristics include the respondents 'job positions, age, educational background, and years of service. First, rural primary school principals account for approximately 81% of the total sample, while rural middle school principals make up 19%. Pu' er City has 179 rural primary schools and 64 rural middle schools, indicating that primary schools far outnumber middle schools in quantity. Second, among the respondents, 41-50-year-old vice-principals constitute about 53% of the total, while those aged 51-60 account for approximately 33%, demonstrating that middle-aged and young professionals form the main demographic group of rural school principals in Pu 'er City. Additionally, most principals have bachelor's degrees, representing about 84% of the total sample, suggesting that this group is well-prepared to embrace new educational trends and provides a solid human resource foundation for advancing educational informatization. Regarding years of service: 90% of respondents possess over 10 years of teaching experience, indicating their substantial expertise in pedagogy and professional competence.

Pu'er City currently has 179 rural primary schools (excluding 173 branch teaching points), 63 rural junior high schools, and 1 rural senior high school. Rural schools account for as much as 87% of the city's total primary and secondary schools. The survey targets principals and full-time vice-principals from public middle and primary schools in rural areas (including villages and townships). The research adopted a questionnaire system where participants completed the forms through Zhiwenxing. After obtaining approval from the Education Informatization Office at Pu 'er Teacher Development Center through interviews, the questionnaires were distributed via the principal's work communication group. All rural school principals and some full-time vice-principals actively participated, resulting in 258 valid responses with a 100% response rate, achieving near-complete coverage of public rural schools in Pu'er City.

Research Instrument

In-depth interviewees：To ensure the rigor and scientific nature of the research, this study adopts interview method as a supplement to further collect hidden questions that cannot be covered by the questionnaire, and explore deeper information to support the data of the questionnaire. This study selects the following three types of interviewees for in-depth interviews:

(1) Director of Education Informatization Office, Pu 'er Teacher Development Center

(2) One principal from the rural demonstration school of Pu 'er City, three principals from the ordinary school and one principal from the weak school. There are 2 principals, a total of 6 principals.

(3) Six teacher representatives from rural primary and secondary schools in Pu 'er City.

Data Collection

Based on the document, the data collection process for this study is comprehensively detailed in Chapter 3: Research Methodology. Here’s a structured summary of the key aspects:

1. Data Collection Methods

1.1 Quantitative Method: Questionnaire Survey

Tool: A structured questionnaire (Appendix A) designed to assess principals’ information technology (IT) leadership across seven dimensions (e.g., personal literacy, communication, planning, construction, management, evaluation, and innovation).

Platform: Distributed via Wenjuanxing (Questionnaire Star), an online survey tool.

Sample: 258 valid responses from rural public primary/secondary school principals and viceprincipals in Pu'er City, Yunnan Province.

Coverage: Achieved 100% response rate, representing all 179 rural primary schools (excluding branch points), 63 junior high schools, and 1 senior high school.

1.2 Qualitative Method: Interviews

Participants:

Director of the Education Information Office, Pu'er Teacher Development Center.

6 principals (from model, regular, and weak schools; mix of primary/middle schools).

6 teacher representatives (from diverse school types).

Format: Semistructured, conducted inperson or online to validate survey findings and explore deeper insights.

2. Data Collection Timeline

Survey PeriodMarch 2025 (aligned with the academic year).

Policy Context: Data referenced policies pre2025 (e.g., Education Informatization 2.0 Action Plan, China Education Modernization 2035).

3. Ethical and Logistical Steps

Approval: Obtained consent from the Education Informatization Office of Pu'er Teacher Development Center.

Distribution: Questionnaires shared via principals' professional WeChat groups.

Validity: Pilottested for reliability (Cronbach's $\alpha > 0.9$) and validity (factor loadings > 0.45 via SPSS).

4. Key Metrics Collected

Demographics: Gender, age, education, tenure, school type (primary/middle), and school category (model/regular/weak).

Leadership Dimensions:

Independent variables: Principals' background (personal traits, leadership style, school context).

Dependent variables: IT literacy, communication, planning, construction, management, evaluation, and innovation capabilities..

Data Analysis

This study employs a quantitative research method to examine the correlation between contingency leadership styles and students' psychological adaptability. The data analysis process commences with screening and preparation, encompassing the management of missing values, identification of outliers, and normality testing through the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk tests. Cronbach's Alpha is computed to verify internal consistency, with values exceeding 0.70 signifying reliable instruments. Only data that has been cleaned and validated will be utilized for analysis, ensuring statistical precision and accuracy.

Descriptive statistics, including mean, standard deviation, frequency, and percentage, are employed to summarize demographic data and key variables, providing a clear picture of student characteristics and response patterns. Subsequently, inferential statistics are applied, with Pearson correlation analysis used to investigate the relationships between leadership styles and adaptability components. Multiple regression analysis is conducted to forecast adaptability outcomes based on task-oriented and relationship-oriented leadership. Additional tests, such as independent t-tests and analysis of variance (ANOVA), are performed to assess differences among student groups (e.g., gender, academic year), highlighting patterns in adaptability.

Statistical analysis software is primarily utilized due to its efficacy in managing survey

data efficiently. Excel may be utilized for data visualization, and AMOS could be employed for structural equation modeling in future research endeavors. Hypothesis testing is conducted with a significance level set at $p < 0.05$. The statistical techniques selected are in line with conventional practices in counseling psychology research, enabling this study to contribute quantitative evidence on the impact of leadership on student resilience in vocational college environments.

Research Results and Discussion

Objective 1: To study focuses on primary and secondary school principals in rural areas of Pu'er City, providing empirical references for enriching and developing theories on rural education informatization. It contributes to broadening the research scope of existing education informatization studies and enriching current research on educational leadership theories.

Objective 2: To study As leading figures in rural education, primary and secondary school principals are the key subjects of this study, which analyzes the influencing factors of their informatization leadership in Pu'er City. To some extent, this research offers theoretical support for education-related administrative departments to accurately assess the level of informatization leadership among rural principals and formulate policies to enhance it.

Objective 3: To studyTinvestigates and analyzes the current state of information leadership among rural primary and secondary school principals in Pu'er City, identifies existing issues, and proposes practical and effective strategies to enhance their information leadership capabilities. It holds significant practical implications, as detailed below:1. The results and conclusions of this study can provide reference for the education authorities in Pu 'er to strengthen the construction of information leadership of rural principals in their region.

Objective 4: To study This study can promote the principals of rural primary and secondary schools in Pu 'er city to further think and re-understand the work of educational informatization, so as to accelerate the informatization process of primary and secondary schools in Pu' er area; the countermeasures and suggestions put forward can provide reference for the areas with similar educational informatization status.

Discussion

This study employs literature review, questionnaire surveys, and interviews to investigate the information leadership capabilities of primary school principals. The findings reveal several challenges in their digital literacy: Principals generally demonstrate inadequate information technology proficiency and insufficient emphasis on educational digitalization. Their management competencies show notable gaps in digital governance, failing to effectively oversee educational activities through digital means. Integration capabilities face coordination difficulties due to outdated infrastructure and limited funding. Innovation capacity remains underdeveloped, as principals lack practical implementation skills to establish concrete foundations for digital reforms, resulting in narrow innovation scopes that prevent fundamental breakthroughs.

Based on the actual conditions of Pu 'er City, this study explores the reasons for weak leadership in primary school principals from three aspects: First, the lack of rational planning in educational administration and insufficient funding mechanisms; Second, school-related factors: uneven digital literacy among teachers and inadequate cultivation of digital capabilities; Third, principals' personal deficiencies in information literacy, lack of digital planning skills, insufficient proficiency in digital teaching, and lack of digital instructional competence. Educational administrative departments should establish robust external support for principal training, including: increasing investment in training funds, enhancing leadership development,

enriching training content and methods, focusing on educational equity, and coordinating regional resource allocation. Schools are advised to strengthen teachers 'digital literacy and application skills through enhanced training to improve the effectiveness of digital teaching. Principals are recommended to continuously enhance their digital literacy, strengthen digital planning capabilities, and elevate digital teaching standards. The concept of digital leadership has become a hot topic, emphasizing not only principals' digital leadership but also the overall competence and capabilities of school digital management teams. Future research on enhancing principals' digital leadership and school digital construction can serve as supplementary studies to educational informatization research.

Educational informatization transcends mere technological assistance in teaching; it fundamentally redefines future educational paradigms. Therefore, principals 'digital leadership requires moving beyond conventional approaches that apply new tools to old methods. Principals must first break free from outdated mindsets and proactively enhance their digital literacy. Simultaneously, government and educational authorities should provide support to develop principals' digital leadership through a dual-track approach. This synergy will drive rural schools to undergo transformative changes amid digital development opportunities, ultimately promoting balanced basic education. This study proposes strategies to improve digital leadership capabilities of rural primary and secondary school principals from two dimensions: endogenous factors (self-improvement) and exogenous factors (external support). In advancing the digital transformation of rural education, Puer City's principals should prioritize enhancing their own digital literacy and leadership proficiency as the foundational step.

Research Suggestions

This study attempts to propose countermeasures to enhance the information leadership of rural primary and secondary school principals from both endogenous (principal self-improvement) and exogenous (external support) perspectives.

I. Internal Enhancement Enhance principals' own information literacy, information construction and planning capabilities, information evaluation capabilities, and innovation abilities; flexibly employ a leadership style that combines transformational and transactional leadership, continuously strengthening the personal influence of principals.

II. External Enhancement The government should increase financial support for the information construction of rural primary and secondary schools; establish a development community for rural primary and secondary school principals within the region; and improve the training system for principals' information leadership.

III. Deepening Information Literacy As the leaders of schools, the improvement of principals' information literacy is particularly critical. Principals should be encouraged to actively participate in information training programs, focusing not only on theoretical learning but also on practical operations and case analysis to ensure a profound understanding of the connotation and value of information-based education. At the same time, establish information learning communities for principals to promote experience exchange and resource sharing, fostering a continuous learning environment.

IV. Enhancement of Construction and Planning Capabilities Regarding information construction and planning capabilities, it is recommended to develop detailed information development strategies, clarify short-term and long-term goals, and ensure that every step of implementation is well-founded. Additionally, introduce an expert consultation mechanism to

leverage external intellectual resources for scientific evaluation and rational planning of information projects, avoiding blind construction and resource waste.

V. Improvement of Evaluation and Feedback Mechanisms Information evaluation capability is one of the important indicators for measuring principals' information leadership. A comprehensive information effectiveness evaluation system should be established, covering multiple dimensions such as infrastructure construction, teaching resource application, and the improvement of teachers' and students' information literacy. Regular evaluations should be conducted, and results should be made public to accept social supervision. At the same time, establish an effective feedback mechanism to adjust strategies promptly, ensuring that information work always progresses in the right direction.

VI. Strengthening Policy and Financial Support At the government level, further increase financial investment in the information construction of rural primary and secondary schools, particularly favoring remote and impoverished areas to ensure that every school can benefit from the educational transformation brought by information technology. Meanwhile, introduce more incentive policies to encourage social capital to participate in rural education information construction, forming a diversified investment landscape.

VII. Community Building and Resource SharingEstablish a development community for rural primary and secondary school principals within the region, promoting exchange and cooperation among principals through regular forums, seminars, and other activities. Promote cross-regional sharing of high-quality information education resources to narrow the information gap between urban and rural areas and among regions, achieving educational equity.

VIII. Optimization and Innovation of the Training System Improve the training mechanism for principals' information leadership, emphasizing the integration of theory and practice, and introducing diversified teaching methods such as case teaching and simulation exercises to enhance the relevance and effectiveness of training. At the same time, encourage principals to participate in advanced domestic and international information education inspections and exchanges, broadening their horizons, absorbing advanced experiences, and continuously improving their information leadership.

In summary, through comprehensive measures combining endogenous and exogenous pathways, the information leadership of rural primary and secondary school principals can be effectively enhanced, laying a solid foundation for the information transformation and high-quality development of rural education.

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