INNOVATION AND TECHNOLOGY LEADERSHIP OF ADMINISTRATORS IN SHENYANG NORMAL UNIVERSITY UNDER LIAONING PROVINCE

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ABSTRACT

The objectives of this research were: (1) to study the level of innovation and technology leadership of administrators at Shenyang Normal University, Liaoning Province; and (2) to compare teacher's perceptions of innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province classified by work experience and educational level.

The research methodology was survey research. The population consisted of 2238 teachers' in Shenyang Normal University under Liaoning Province, the People's Republic of China. The sample consisted of 345 teachers. The sample size was determined by Krejcie and Morgan's Table and obtained by simple random sampling technique. The instrument used for data collection was a five-point rating scale questionnaire. The

statistics used for data analysis were frequency, percentage, mean, Standard Deviation, and t-test.

The research results showed that; (1) innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province, overall and in each aspect was at a moderate level; and (2) comparison of innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province, classified by work experience and educational level, overall and in each aspect were not different.

Keywords: Innovation and technology leadership and Technology Leadership, Administrators, Shenyang Normal University, Liaoning Province

INTRODUCTION

Taking Shenyang Normal University in Liaoning Province as a case study, as a local normal university, it faces numerous challenges in its development. With limited resources, how to deepen the construction of a smart campus, promote information-based teaching reform, and enhance the modernization of educational governance are core issues for the school's high-quality development. These problems require school administrators to possess outstanding innovation and technology leadership, formulate scientific digital development strategies, integrate

internal and external technological and educational resources, and promote the sustainable development of the school.

Through the research on the innovation and technology leadership of administrators at Shenyang Normal University, this study deeply analyzes the current status, existing problems, and influencing factors of administrators' innovation and technology leadership in the school, and proposes targeted improvement strategies. It provides a reference for school administrators to enhance their innovation and technology leadership, helping the school improve the innovation and technology leadership system, optimize resource allocation, and raise the quality and competitiveness of school management.

At the same time, it is hoped that the research results can provide a reference for other similar universities to improve the innovation and technology leadership of their administrators, offer theoretical support and practical experience for their cultivation and development, promote the improvement of the overall quality of university administrators, advance the process of digital transformation in higher education, and realize the benign interaction between higher education and social and economic development. Administrators with outstanding innovation and technology leadership can enable universities to better adapt to the needs of social and economic development, cultivate talents meeting the requirements of the digital era, strengthen technological cooperation and resource sharing with

enterprises and society, provide intellectual support and talent guarantee for social and economic development, and further promote the benign interaction between higher education and social and economic development.

Research Objectives

1 To study the level of innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province.

2 To compare teacher's perceptions of innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province, classified by work experience and educational level.

Conceptual Framework

In this research, the researchers the concepts of Matthew Koehler & Mishra (2006) concept in innovation and technology leadership. Define a conceptual framework for the innovation and technology leadership of administrators in Shenyang Normal University under Liaoning Province, as shown in Figure 1:

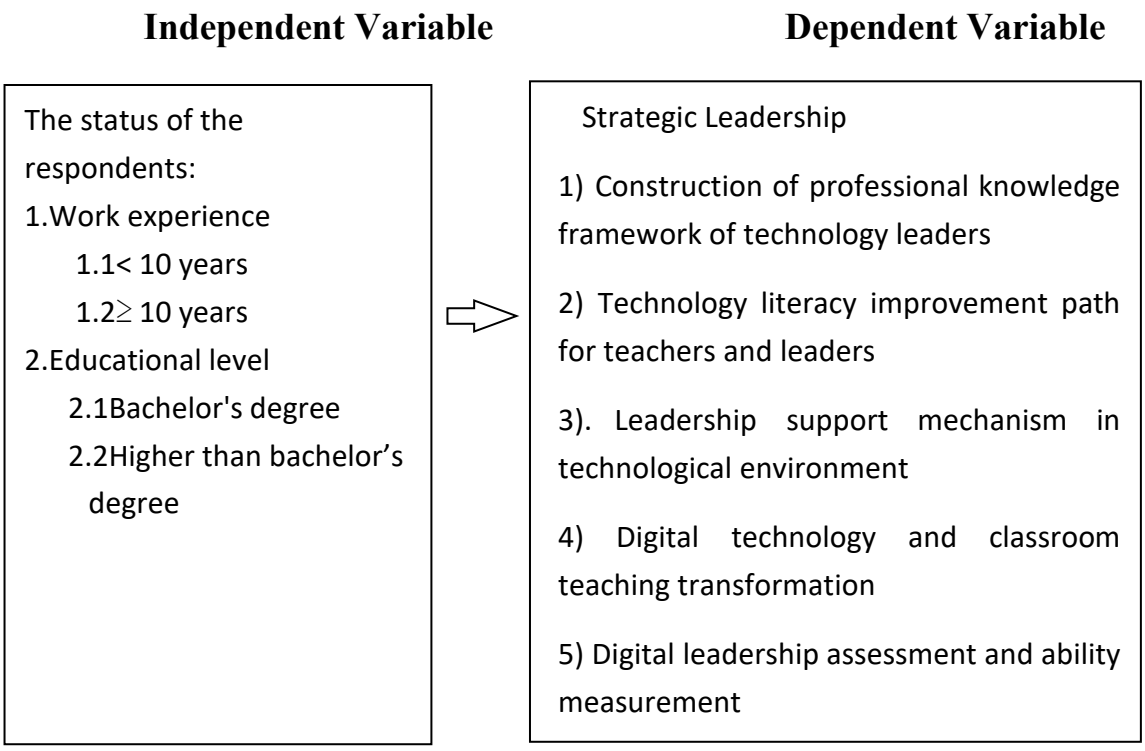

Figure 1 – Conceptual Framewor

Methods of conducting research

Population: The population were teachers' Shenyang Normal University, Liaoning Province in 2025, totaling 2,238 people.

Sample: The sample consisted of 345 teachers from Shenyang Normal University, Liaoning Province. The sample size is determined according to Krejcie & Morgan's sampling table (1970), and selected using simple random sampling.

Research instruments

The instrument used in this study was a questionnaire. This questionnaire is divided into three parts as follows:

Part 1: Questionnaire about the general information of the respondents.

Part 2: The questionnaire on Innovation and Technology Leadership of Administrators at Shenyang Normal University, Liaoning Province, including five dimensions: (1) Construction of Professional Knowledge Framework of Technology Leaders (TPACK); (2) Technology Literacy Improvement Path for Teachers and Leaders; (3) Leadership Support Mechanism in Technological Environment; (4) Digital Technology and Classroom Teaching Transformation; (5) Digital Leadership Assessment and Ability Measurement.

Data analysis

This research title was Research on Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province.The objectives:(1) To study the level of Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province; and (2) To compare teachers' perceptions of Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province classified by work experience and educational level.

Data analysis results

Table 1 General information of the respondents**:**

(n=345)

General Information	**Frequency**	**Percentage**
1. Work experience		
1.1 < 10 years	165	47.83
1.2 ≥ 10 years	180	52.17
Total	345	100
2..Educational Level		
2.1 Bachelor's degree	121	35.07
2.2Higher than bachelor's degree	224	64.93
Total	345	100

Table 1 was found that the teachers of Shenyang Normal University under Liaoning Province the respondents had 180 people representing 52.17% have more than 10 years of work experience and 224 people representing 64.93% of educational level.

Table 2 Show the Mean, Standard Deviation, and level of the Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province, overall and in each aspect:

(n=345)

No.	Innovation and Technology Leadership of Administrators	$\overline{X}$	S.D.	Level
1	Construction of Professional Knowledge Framework of Technology Leaders (TPACK)	3.00	2.00	Moderate
2	Technology Literacy Improvement Path for Teachers and Leaders	3.00	1.82	Moderate
3	Leadership Support Mechanism in Technological Environment	3.00	2.21	Moderate
4	Digital Technology and Classroom Teaching Transformation	3.01	2.01	Moderate
5	Digital Leadership Assessment and Ability Measurement	3.00	2.01	Moderate
Totall		3.11	3.00	Moderate

Table 4.2 was found that the Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province: overall and in each aspect at a moderate level ($\overline{X}$ = 3.00). Considering and in each aspect, it was found that all aspects were at a moderate level. Digital Technology and Classroom Teaching Transformation had the highest mean ($\overline{X}$ = 3.01), and that Construction of Professional Knowledge Framework of Technology Leaders (TPACK), Technology Literacy Improvement Path for Teachers and Leaders, Leadership Support Mechanism in Technological Environment and Digital

Leadership Assessment and Ability Measurement had the lowest mean ($\overline{X}$ = 3.00).

Table 3 Comparison of Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province classified by educational level, overall aspect:

(n=345)

Innovation and Technology Leadership of Administrators	Educational level				t	Sig.
	Bachelor's degree		Higher than Bachelor's degree			
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Construction of Professional Knowledge Framework of Technology Leaders (TPACK)	3.01	0.21	3.00	0.20	0.02	0.987
Technology Literacy Improvement Path for Teachers and Leaders	3.01	0.17	3.00	0.19	0.03	0.976
Leadership Support Mechanism in Technological Environment	3.02	0.25	3.00	0.21	0.60	0.552
Digital Technology and Classroom Teaching Transformation	3.04	0.18	2.99	0.21	0.27	0.024
Digital Leadership Assessment and Ability Measurement	3.01	0.21	3.00	0.18	0.76	0.450
Total	3.02	0.46	3.00	0.44	0.52	0.604

Table 3 was found that, teacher with different educational level came to recognize the Innovation and Technology Leadership of

Administrators in Shenyang Normal University under Liaoning Province, classified by educational level, overall was not different.

Table 4 Comparison of Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province, classified by work experience, overall aspect:

(n=345)

Innovation and Technology Leadership of Administrators	Work Experience				t	Sig.
	< 10 years		≥ 10 years			
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Construction of Professional Knowledge Framework of Technology Leaders (TPACK)	2.99	0.20	3.02	0.20	-1.54	0.125
Technology Literacy Improvement Path for Teachers and Leaders	3.01	0.19	3.00	0.18	0.43	0.670
Leadership Support Mechanism in Technological Environment	2.99	0.22	3.02	0.22	-1.30	0.195
Digital Technology and Classroom Teaching Transformation	3.00	0.22	3.02	0.18	-1.00	0.322
Digital Leadership Assessment and Ability Measurement	3.00	0.20	3.01	0.19	-0.34	0.735
Total	3.00	0.45	3.01	0.44	-0.28	0.780

Table 4: was found that, teacher with different work experience came to recognize the Innovation and Technology Leadership of Administrators in Shenyang Normal University under Liaoning Province, classified by work experience, overall was not different.

Discussion

Based on the research objectives, the discussion will be presented as follows:

1. Discussion about major findings of objective 1

The level of Innovation and Technology Leadership of Administrators in Shenyang Normal University Liaoning Province is at a moderate level, which is consistent with the general status of technology leadership development in higher education. Driven by the educational digitalization strategy, university administrators have acquired basic technology application and innovation promotion capabilities, but they have not yet reached a high level due to factors such as resource allocation, organizational culture, and teacher acceptance.

（1） Construction of Professional Knowledge Framework of Technology Leaders (TPACK) was found, According to the data in Tables 4.2 and 4.3, the high score in "guidance on the integration of pedagogy and technology" and the low score in "knowledge system integration and update" are consistent with Matthew Koehler & Mishra's (2006) TPACK framework theory, which emphasizes the dynamic integration of technology, pedagogy, and content knowledge as the core of technology leadership. Current administrators perform well in guiding technology application in specific teaching scenarios but lack systematic knowledge integration thinking and continuous learning awareness. As Wang Guohua

(2016) pointed out, modern university administrators need to possess dual capabilities of "technology integration + organizational reform", and the dynamic update of knowledge systems is the foundation for achieving this capability.

（2）Technology Literacy Improvement Path for Teachers and Leaders was found, According to the data in Tables 4.2 and 4.4, the characteristic of strong "planning and organization" but weak "resource supply" reflects that administrators tend to "prioritize form over effectiveness" in promoting teachers' technology literacy. Michael Fullan (1982) emphasized that the success of educational reform depends on accurate responses to frontline needs; if technology training resources do not match teachers' actual needs, it will be difficult to achieve the expected results. This phenomenon also deviates from the requirements of the "platform-decision-feedback" trinity governance model proposed by Li Xiaofeng (2017), lacking a feedback and optimization mechanism for resource supply effects.

（3）Leadership Support Mechanism in Technological Environment was found, According to the data in Tables 4.2 and 4.5, the prominent strategic planning capability but insufficient grassroots feedback response is consistent with the open system theory of school organizations proposed by Hoy and Miskel (2007)—administrators can perceive external industry trends and formulate corresponding plans but are disconnected from

internal teachers in interactive feedback. Anderson & Dexter's (2005) technology leadership theory also emphasizes that effective technology support lies not only in "introducing technology" but also in "supporting others to use technology successfully", and collecting and responding to teachers' opinions is the key to achieving this goal.

（4）Digital Technology and Classroom Teaching Transformation was found, According to the data in Tables 4.2 and 4.6, the remarkable macro promotion effects but insufficient micro guidance are consistent with the common challenges of current educational digital transformation. Larry Cuban once pointed out that if technology application does not penetrate into the level of teaching activity design, it will be difficult to achieve true teaching reform. Darling-Hammond (2010) also emphasized that technology should serve "student-centered" deep learning, and administrators need to transform from "technology promoters" to "teaching reform guides" and strengthen targeted guidance on teaching activity design.

（5）Digital Leadership Assessment and Ability Measurement was found，According to the data in Tables 4.2 and 4.7, the good performance in multi-stakeholder participation evaluation but insufficient application of results violates the closed-loop logic of "evaluation-feedback-improvement". Koehler advocated that digital leadership evaluation should adopt diversified tools and use the results for targeted improvement.

Current administrators attach importance to stakeholder feedback participation but fail to effectively transform evaluation results into personalized improvement plans, leading to superficial evaluation that is difficult to achieve continuous optimization of leadership.

2.Discussion about major findings of objective 2

The comparative analysis results from the level of Innovation and Technology Leadership of Administrators in Shenyang Normal University Liaoning Province, classified by work experience and educational level.

(1) The absence of significant differences in perceptions among teachers with different work experience is consistent with the research conclusion of Kim and Lee (2014), i.e., effective leadership practices are universal across tenure. The core reason is that the university's technology management mechanisms (such as training systems, support channels, and evaluation standards) are relatively unified, reducing cognitive differences caused by work experience. Luturlean et al. (2019) also pointed out that when an organization forms a stable technology leadership culture and behavioral norms, employees with different experience levels will converge in their perceptions of leadership.

(2) The absence of significant differences in overall perceptions among teachers with different educational levels but significant differences in the "Digital Technology and Classroom Teaching Transformation" dimension has unique practical significance. Based on Mintzberg's

strategic and structural configuration framework, Bester (2012) pointed out that when organizational processes are highly coupled with strategic intentions, the interference of individual characteristics on leadership perceptions will be significantly reduced, which explains the consistent overall perceptions. The cognitive differentiation in specific dimensions may stem from different needs and expectations of teachers with different educational backgrounds for the integration of technology and teaching—teachers with a master's degree or above may have higher requirements for the in-depth application of technology in teaching activity design, while those with a bachelor's degree may pay more attention to the convenience and basic application of technology. This is consistent with Chen et al.'s (2018) research finding that "different educational background groups may have cognitive differences in specific dimensions".

Recommendations of research

(1) Strengthen knowledge integration and dynamic update

Establish "TPACK Knowledge Integration Workshops": Organize administrators to participate in interdisciplinary technology teaching seminars, and improve their ability to integrate technological knowledge, pedagogical knowledge, and content knowledge through case analysis, simulation practice, etc.; invite experts in the field of technology to give regular lectures to help administrators track technological development trends and update the TPACK knowledge system. Establish a "TPACK

Practice Reflection Mechanism": Require administrators to regularly record successful cases and problems in technology application, conduct reflective summaries combined with teachers' feedback, and form personal TPACK improvement files to promote the dynamic optimization of knowledge systems.

(2) Optimize resource supply and demand matching

Conduct "Teachers' Technology Needs Surveys": Regularly collect teachers' specific needs in technology training and resource support through questionnaires, interviews, etc., establish a demand database, and provide diversified and personalized training resources (such as hierarchical technology courses, special skills training camps) in a targeted manner.Improve the "Technology Learning Community": Encourage backbone teachers to take the lead in establishing technology teaching interest groups, and promote the sharing of technology experience among teachers through regular exchanges, case sharing, and mutual guidance to make up for the shortage of training resources.

(3) Strengthen grassroots feedback and mechanism optimization

Establish a "Technology Support Feedback Closed Loop": Set up special technology feedback channels (such as online platforms, suggestion boxes), clarify feedback processing time limits and response processes; regularly summarize teachers' feedback opinions, form optimization reports, and dynamically adjust technology support measures.Optimize

Grassroots Participation in Technology Development Planning: Invite teacher representatives from different disciplines and with different work experience to participate in discussions when formulating technology development plans, fully absorb reasonable suggestions from frontline teaching practice, and ensure the scientificity and feasibility of the plans.

(4) Deepen micro guidance and teaching integration

Conduct "Special Training on Digital Teaching Activity Design": Organize special training, model class observations, and other activities targeting the difficulties in applying technology in teaching activity design to improve administrators' guidance ability to teachers; compile the "Guide to Digital Technology Teaching Activity Design" to provide specific cases and operation methods.Promote "Digital Teaching Pilot Projects": Select some classes or disciplines to carry out pilot projects of in-depth integration of digital technology and teaching activities, with administrators participating in guidance throughout the process, and promote successful experience across the university after summarization.

(5) Strengthen the implementation and application of evaluation results

Establish an "Evaluation-Improvement" Closed Loop Mechanism: Formulate personalized improvement plans for each administrator based on digital leadership evaluation results, clarifying improvement goals, specific measures, and time nodes; regularly track improvement effects and

adjust plans according to progress.Improve the Correlative Application of Evaluation Results: Link digital leadership evaluation results with administrators' performance appraisals and career development, and establish an incentive mechanism to encourage administrators to attach importance to evaluation results and actively participate in improvement activities.

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