The Boundary-Spanning leadership Model for Higher Education administrators of applied universities in Dalian.

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Abstract

This research focuses on the boundary-spanning leadership of higher education administrators in Dalian's applied universities. Aiming to determine its components and indicators, propose a model, and develop improvement guidelines. Using a mixed-method approach with 13,910 administrators and teachers from 12 universities as the population and 392 as the sample. The results show the model consists of five components: Inspiration, Foresight, Decisiveness, Integration, and Resilience. The theoretical model aligns with empirical data, confirming the research hypothesis. The improvement guidelines involve aspects like inspiring shared vision and adopting structured strategies, providing valuable references for enhancing leadership in such universities. Recommendation for Practical Application 1. Inspiration University admins should organize seminars/workshops with experts from various fields. This can expand knowledge and inspire new research/teaching methods. For instance, an engineering and design dept. can jointly hold a seminar. Also, set up an "Innovation Incentive Fund" to support creative multi-disciplinary projects. 2.Foresight Set up a "Future Trends Research Center" with admins, faculty from different disciplines, and industry reps. It researches emerging tech, social needs, and policy trends. Admins should also encourage faculty to attend international conferences and exhibitions and share experiences. 3.Decisiveness: Develop a "Boundary-Spanning Decision-Making Procedure Manual" for clear processes and responsibilities in cross-disciplinary issues. Strengthen communication with faculty and students when making decisions. 4.Integration: Create a "Boundary-Spanning Collaboration Platform" using IT to break departmental barriers and facilitate resource sharing. Promote joint development of interdisciplinary courses. 5.Resilience: Organize "Crisis Simulation Exercises" to improve response and adaptation. Establish a "Resilience Support Network" with internal and external resources for support during difficulties.

Keywords: Boundary-spanning Leadership Model, Administrators, Applied Universities, Dalian

Introduction

In the dynamic realm of higher education, the concept of boundary-spanning leadership has surfaced as a crucial factor for promoting effective management and innovation in universities. Stemming from the theories of leadership across boundaries and organizational synergy, this approach emphasizes the ability to bridge diverse departments, disciplines, and external entities, facilitating seamless collaboration, communication, and integration (He, 2014; Burkhardt, 2002). Extensive research has shown that boundary-spanning leadership not only bolsters institutional competitiveness but also empowers educational institutions to adeptly handle the intricate

challenges posed by the evolving educational landscape (Prysor & Henley, 2017; Hill, 2023). As higher education institutions worldwide strive to keep pace with technological advancements, industry demands, and policy shifts, the significance of boundary-spanning leadership has reached new heights.

Dalian's applied universities, in particular, are witnessing rapid growth and transformation. This expansion brings with it a plethora of opportunities for academic and professional development. However, it also ushers in unique hurdles, such as the pressing need for enhanced cross-departmental and cross-disciplinary cooperation, as well as improved coordination between internal and external stakeholders. Conventional leadership models, which typically focus on siloed management and narrow disciplinary expertise, have fallen short in meeting these emerging requirements. These models often lead to inefficiencies in resource allocation, communication breakdowns, and sluggish responses to strategic and operational changes (Xu, 2008; Chen, 2015). Additionally, Dalian's distinct industrial and cultural backdrop, combined with the increasing emphasis on practical and applied education, calls for a more innovative leadership approach that transcends boundaries and fosters comprehensive integration.

Boundary-spanning leadership presents a viable solution to these challenges by enabling administrators to break down barriers, leverage diverse resources, and make well-informed decisions. This leadership paradigm equips university administrators with the means to surmount institutional obstacles, optimize resource distribution, and foster a cohesive and vibrant institutional culture that nurtures innovation and growth (Yu, 2014; Zheng et al., 2015). Nevertheless, despite its theoretical potential, there remains a dearth of empirical research and practical frameworks customized to the specific leadership demands of administrators in Dalian's applied universities. This gap restricts the ability of institutional leaders to effectively implement boundary-spanning strategies that align with their unique operational, cultural, and academic contexts.

To fill this void, this research endeavors to construct a comprehensive boundary-spanning leadership model explicitly designed for the specific needs of higher education administrators in Dalian's applied universities. Guided by three primary objectives, the study initially sets out to identify the key components and indicators of boundary-spanning leadership that are highly relevant to these administrators. This step lays the groundwork for the model's development by pinpointing the fundamental elements essential for effective leadership across boundaries. Secondly, the research aims to formulate a detailed boundary-spanning leadership model that amalgamates these components and indicators into a unified and coherent framework. This model is carefully tailored to align with the distinctive administrative and educational characteristics of Dalian's applied universities, with a focus on promoting interdisciplinary collaboration, endowing leaders with the necessary competencies, and cultivating an inclusive institutional culture. It is designed to facilitate efficient decision-making, optimize resource utilization, and create an environment that stimulates innovation and academic achievement. Thirdly, the study will put forward practical guidelines for enhancing boundary-spanning leadership, providing administrators with actionable strategies to implement the model and effectively address institutional challenges. Although the model is primarily developed with Dalian's applied universities in mind, it is anticipated to yield broader insights applicable to higher education institutions in general. By offering guidance on implementing boundary-spanning leadership across diverse educational settings, the research findings strive to bridge the gap between theory

and practice, thereby advancing the effectiveness, adaptability, and excellence of higher education leadership.

The outcomes of this study are expected to have far-reaching implications beyond Dalian, offering valuable theoretical and practical contributions to educational leaders globally. As higher education institutions worldwide grapple with the increasing need for boundary-spanning cooperation and innovation, this research will supply practical strategies for nurturing leadership that fosters adaptability, creativity, and academic distinction. By bridging the divide between theoretical concepts and real-world applications, this study aims to enhance the capacity of higher education institutions to navigate the complexities of boundary-spanning leadership, ultimately driving sustainable development and organizational resilience within the global higher education community.

Research Objectives

(1) To determine the components and indicators of higher education administrators' boundary-spanning leadership.

(2) To propose administrators' boundary-spanning leadership model for higher education administrators of applied universities in Dalian.

(3) To develop the guidelines for improving higher education administrators' boundary-spanning of applied universities in Dalian.

Research Hypothesis

The administrators' boundary-spanning leadership model for administrators in Dalian applied universities is consistent with the empirical data.

Review of Literature and Concepts

Significance of Boundary-Spanning Leadership

Boundary-spanning leadership has emerged as a highly significant concept in higher education, particularly in the context of the increasing complexity and interconnectedness of educational institutions. As universities face the need to adapt to rapid technological advancements, industry demands, and policy changes, boundary-spanning leadership offers a means to bridge the gaps between different departments, disciplines, and external stakeholders (He, 2014; Burkhardt, 2002). By transcending traditional boundaries, this leadership approach facilitates the exchange of ideas and resources, leading to enhanced innovation and problem-solving capabilities.

This type of leadership is crucial for promoting effective collaboration across various domains within higher education. It enables administrators to break down silos and encourage cooperation among faculty, staff, and students from different backgrounds. This, in turn, enriches the learning and research environment by bringing together diverse perspectives and expertise (Prysor & Henley, 2017; Hill, 2023). For example, in interdisciplinary research projects, boundary-spanning leaders can facilitate the integration of knowledge from different fields, leading to more comprehensive and impactful outcomes.

Moreover, boundary-spanning leadership enhances the adaptability of higher education institutions. In a constantly changing educational landscape, leaders with boundary-spanning skills are better equipped to anticipate and respond to emerging challenges. They can navigate the

dynamic environment by forging partnerships with external organizations, such as industries and community groups, ensuring that the institution remains relevant and responsive to societal needs (Yu, 2014; Zheng et al., 2015).

In addition, boundary-spanning leadership plays a vital role in promoting cultural diversity and inclusivity within universities. By fostering communication and collaboration across different cultural and disciplinary boundaries, leaders can create an environment where all members feel valued and included. This leads to a more vibrant and creative academic community, where diverse ideas can thrive and contribute to the growth of the institution (Kotter, 1996).

Finally, boundary-spanning leadership is essential for driving institutional change and improvement. Leaders who can effectively span boundaries can identify best practices from different contexts and implement them within their own institutions. This helps to optimize administrative processes, enhance teaching and learning outcomes, and ultimately the overall performance of the university (Goleman, 1995; Nishii & Mayer, 2009).

In summary, boundary-spanning leadership is of utmost importance in higher education as it promotes innovation, adaptability, inclusivity, and institutional development.

Leadership in Dalian's Applied Universities

In Dalian's applied universities, the need for effective leadership has become increasingly apparent as these institutions strive to meet the demands of a rapidly evolving regional and global economy. The unique characteristics of applied universities, which focus on practical and industry-oriented education, require leaders who can bridge the gap between academia and the workplace (Xu, 2008; Chen, 2015).

Some institutions in Dalian have started to recognize the value of boundary-spanning leadership and have initiated efforts to develop leadership capabilities in this regard. For instance, certain universities have established industry-academic cooperation platforms, where administrators play a key role in facilitating communication and collaboration between faculty and industry partners. This has led to the development of more relevant and practical educational programs, as well as increased research opportunities and internships for students (Maofang C., 2021).

However, challenges still exist. Traditional leadership models that emphasize hierarchical structures and discipline-specific expertise may not be sufficient to meet the needs of applied universities. There is a need for leaders to develop a broader perspective and the ability to integrate different resources and stakeholders. Additionally, the rapid pace of technological change and the increasing complexity of the industry require administrators to continuously update their knowledge and skills in boundary-spanning leadership (Jin Zhanzhong et al., 2014).

In conclusion, while progress has been made in promoting boundary-spanning leadership in Dalian's applied universities, there is still room for improvement to fully realize its potential in enhancing institutional effectiveness and competitiveness.

Key Components of Boundary-Spanning Leadership

Boundary-spanning leadership in higher education encompasses several essential components that are crucial for its effective implementation.

Inspiration is a key element, as it involves the ability of leaders to inspire and motivate individuals and teams across different boundaries. This includes creating a shared vision that encourages collaboration and a sense of purpose among diverse groups. Leaders need to communicate effectively and inspire others to overcome barriers and work towards common goals (West, 2002; Kluger & DeNisi, 1996).

Foresight is also vital, enabling leaders to anticipate future challenges and opportunities that arise from crossing boundaries. This requires strategic thinking and the ability to analyze trends and developments in different fields. Leaders with foresight can proactively plan and make decisions that position their institutions for success in a changing environment (Teece, 2007; Kotter, 1996).

Decisiveness is essential when dealing with complex and ambiguous situations involving multiple boundaries. Leaders must be able to make timely and effective decisions, balancing the needs and perspectives of different stakeholders. This involves gathering and evaluating information, as well as having the courage to take action (Yukl, 2006).

Integration is the skill of bringing together diverse ideas, cultures, and practices across boundaries to create cohesive and innovative solutions. Leaders need to foster an environment where different departments and disciplines can work together smoothly, sharing resources and knowledge. This promotes synergy and enhances the overall effectiveness of the institution (Hofstede, 2001; Senge, 1990).

Resilience is the ability to adapt and bounce back from setbacks or challenges in the boundary-spanning process. Leaders need to be able to maintain focus and persistence in the face of difficulties, learning from experiences and continuously improving their leadership effectiveness (Nishii & Mayer, 2009; Goleman, 1995).

In essence, these key components of boundary-spanning leadership work together to enable administrators to navigate the complex landscape of higher education and drive institutional success. By developing and applying these components, leaders can effectively bridge boundaries and promote the growth and development of their institutions.

Research Methodology

Qualitative Research: The research initiated with an in-depth qualitative exploration. A comprehensive review of existing literature related to boundary-spanning leadership was conducted to establish a foundational understanding and theoretical backdrop. Subsequently, semi-structured interviews were carried out with a carefully selected group of key informants. These included educational administrators with extensive experience in Dalian's applied universities, such as department heads, deans, and those involved in university-enterprise joint institutions. The aim of these interviews was to identify and clarify the essential components and potential indicators of boundary-spanning leadership within the context of these institutions. Through content analysis of the interview data, a detailed and context-specific understanding of the leadership elements was developed.

Quantitative Research: After the qualitative phase, the research transitioned to a quantitative stage. A meticulously designed questionnaire was developed based on the findings from the literature review and interviews. The questionnaire was then distributed to a large sample of administrators and teachers from the 12 applied universities in Dalian. The collected quantitative data were analyzed using a variety of statistical techniques. Descriptive statistics were utilized to present a clear picture of the demographic characteristics and initial responses. Additionally, Confirmatory Factor Analysis (CFA) was applied to rigorously test and validate the hypothesized structure of the boundary-spanning leadership model. This combination of qualitative and quantitative research methods ensured a robust and comprehensive assessment of the model's validity and practicality, providing a solid foundation for the subsequent development and application of the model.

Population and Sample

The research targeted a population of 13,910 individuals, encompassing administrators and full-time teachers from 12 applied universities in Dalian. To ensure a scientifically sound determination of the sample size, the G*Power program was utilized. This advanced statistical tool is highly regarded for its ability to calculate sample sizes based on specific parameters such as degrees of freedom, error probability, effect size, and power.

A proportional stratified random sampling method was implemented to obtain a representative sample. The population was stratified into different subgroups according to the universities they belonged to. This stratification was crucial in maintaining the diversity and heterogeneity of the sample, thereby enhancing the reliability and external validity of the research findings. Based on the calculations and sampling method, a sample of 392 individuals was carefully selected. This sample included both administrators and full-time teachers from various departments and levels within the 12 universities. These participants were invited to participate in the research activities, including surveys and interviews, providing the necessary data for the development and validation of the boundary-spanning leadership model for higher education administrators in Dalian's applied universities.

Research Instruments

To fulfill the research goals, the key data collection tools in this study were a semi-structured interview form and a five-point rating scale questionnaire. The questionnaire was carefully crafted to gather the data necessary for constructing and validating the boundary-spanning leadership model for higher education administrators in Dalian's applied universities. The five-point rating scale enabled a detailed assessment of the respondents' views and evaluations regarding different aspects of boundary-spanning leadership.

The questionnaire encompassed a wide range of items related to the components and indicators of boundary-spanning leadership identified through prior research and expert consultations. Respondents were asked to rate each item on a scale from 1 (strongly disagree) to 5 (strongly agree). This allowed for a precise measurement of the degree to which these leadership elements were perceived and practiced by the administrators and teachers. For example, items related to inspiration might ask about the extent to which leaders encouraged cross-disciplinary projects or facilitated knowledge sharing among different departments. Through this structured approach, the research could effectively capture the empirical data needed to analyze the current state of boundary-spanning leadership and test the proposed model's validity and practicality within the context of the target institutions.

Data Analysis

The data analysis process was systematically structured to meet the research objectives. Firstly, descriptive statistical analysis was utilized to examine the demographic details of the 392 respondents. Frequencies and percentages were calculated for variables such as gender, age groups, educational attainment, job positions, and years of work experience. This provided a clear picture of the sample's characteristics and served as a fundamental basis for further analysis.

Subsequently, Confirmatory Factor Analysis (CFA) was carried out to evaluate the construct validity of the proposed boundary-spanning leadership model. CFA was crucial in testing the hypothesized relationships between the observed variables and the underlying latent constructs of inspiration, foresight, decisiveness, integration, and resilience. It determined whether the theoretical framework of the model was well-supported by the empirical data collected from the questionnaires. By rigorously applying CFA, the model's parameters were precisely estimated and

verified, ensuring the reliability and applicability of the model within the context of Dalian's applied universities. This comprehensive data analysis approach enabled a thorough assessment of the model's validity and its potential to explain and guide the practice of boundary-spanning leadership in the target institutions.

Conclusion and Data Analysis Results

The data analysis conducted in this study revealed a significant alignment between the proposed boundary-spanning leadership model and the empirical data collected from the 12 applied universities in Dalian. As presented in the accompanying tables and figures, the model demonstrated a satisfactory level of fit, thereby confirming its validity and reliability within the specific context of these institutions.

Components and Indicators of the Boundary-Spanning Leadership Model: The boundary-spanning leadership model for higher education administrators in Dalian's applied universities consists of five key components, each accompanied by specific indicators that are instrumental in promoting effective leadership across boundaries.

Inspiration (I): This component focuses on fostering motivation and a shared vision among individuals and teams from different backgrounds:

I1: Encourage organizational members to exchange knowledge with one another.

I2: Promoting a culture where experienced team members mentor and coach newer team members, transferring knowledge.

I4: Openly sharing data, with all relevant stakeholders to ensure everyone is informed and aligned.

I7: Encouraging a culture of transparency and collaboration around data sharing.

Foresight (F): This component emphasizes the ability to anticipate future trends and opportunities, enabling proactive leadership:

F2: Articulate and communicate clear and achievable goals for individuals and teams.

F3: Offer precise and detailed instructions on tasks, projects, and expectations.

F5: Set meaningful work goals and tasks.

F9: Recognizing organizational members' contributions reinforces the value of their work and fosters a positive work environment.

Decisiveness (D): This component is crucial for making timely and effective decisions in complex and ambiguous situations involving multiple boundaries:

D1: Enable organizational members to decide on how to do their work.

D4: Give the organizational members the authority to make changes necessary to improve things.

D6: Give the organizational members the corresponding permissions so that they can make independent decisions in their work.

Integration (IBSL): This component centers around integrating diverse ideas, cultures, and practices to create cohesive and innovative solutions:

IBSL2: Actively listen to team members, demonstrating empathy and respect for their perspectives.

IBSL3: Encourage all organizational members to participate in discussions, ensuring that everyone's voice is heard and valued.

IBSL7: Granting organizational members the right to participate in the organization's plans, meetings, and decisions.

Resilience (R): This component highlights the ability to adapt and recover from setbacks or challenges in the boundary-spanning process:

R1: Actively listen to team members, demonstrating empathy and respect for their perspectives.

R3: Encourage all organizational members to participate in discussions, ensuring that everyone's voice is heard and valued.

R4: Granting organizational members the right to participate in the organization's plans, meetings, and decisions.

R10: The ability to maintain flexibility and adaptability in the face of complex or ambiguous environments, by continuously adjusting mindset or course of action, avoiding rigidity or slow responses.

Table 1 Model Fit Indices for Five Components

Indicator Name	χ^2	df	p	x^2/df	GFI	RMSEA	RFI	CFI	NFI	TLI
Value	170	130	0.062	1.309	0.952	0.028	0.961	0.992	0.967	0.991

Table 2 Display as Statistical Values of the Model

	Variate/Item	STD.Estimate	S.E.	C.R.	P	CR	AVE	R²
	I (0.610)							
	I1	0.846						
	I2	0.823	0.049	19.684	***	0.913	0.723	0.372
	I4	0.851	0.046	20.742	***			
	I7	0.880	0.043	21.790	***			
	F (0.665)							
	F2	0.800						
Boundary Spanning Leadership	F3	0.826	0.046	18.625	***	0.922	0.748	0.442
	F5	0.913	0.049	21.373	***			
	F9	0.914	0.050	21.406	***			
	D (0.692)							
	D1	0.846						
	D4	0.824	0.055	19.116	***	0.890	0.730	0.479
	D6	0.891	0.050	20.735	***			
	IBSL (0.697)							
	IBSL2	0.853				0.881	0.711	0.486
	IBSL3	0.815	0.055	18.503	***			

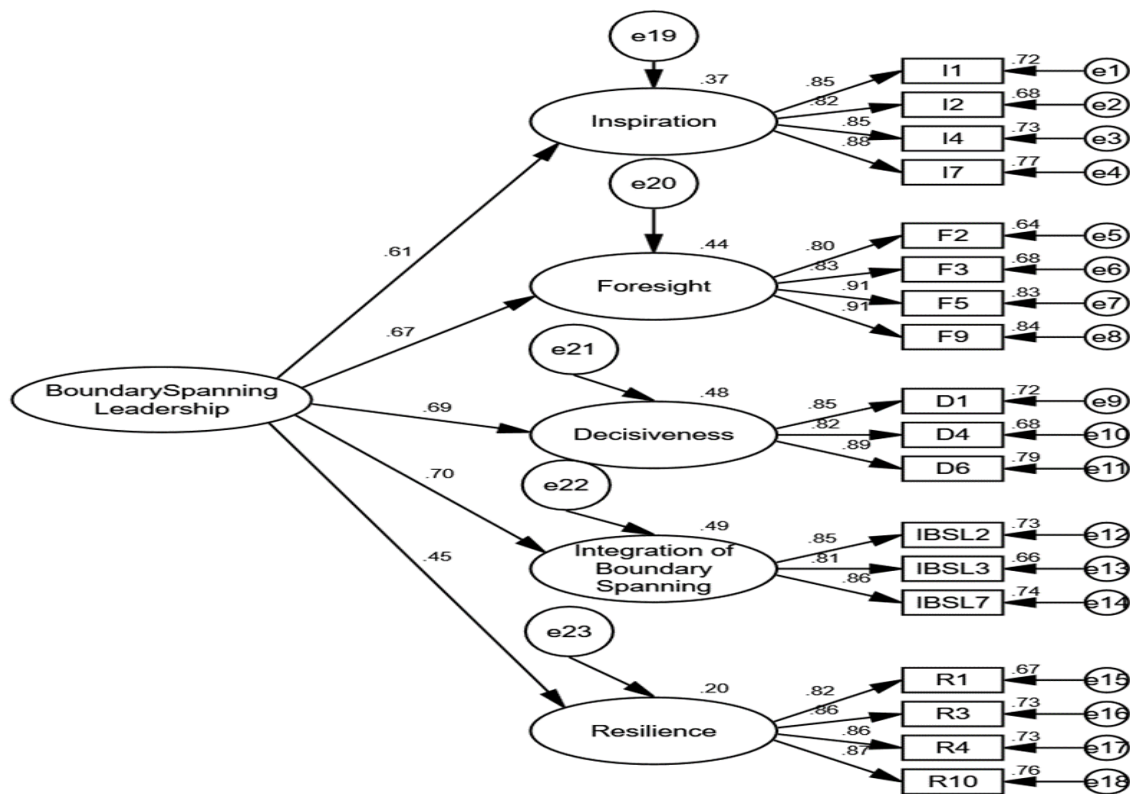| IBSL7	0.861	0.055	19.610	***			
R (0.450)							
R1	0.818						
R3	0.856	0.054	19.766	***			
R4	0.857	0.056	19.777	***	0.913	0.723	0.203
R10	0.870	0.057	20.184	***			

Figure 1 The Second-Order Model of Boundary-Spanning Leadership Consistent with the Empirical Data

Model Fit and Validation: As presented in the relevant figure and table (see Figure 1, Table 1, and Table 2), the Confirmatory Factor Analysis (CFA) yielded a series of significant fit indices that unmistakably indicate a robust alignment between the proposed boundary-spanning leadership model and the collected empirical data. The Relative Chi-square (χ^2/df) ratio was determined to be 1.31, which is comfortably beneath the commonly recognized threshold of 3, thereby denoting an outstanding model fit (Kline, 2015). The model's Degrees of Freedom (df),

calculated as 130, adequately represent the complexity inherent in the model while still ensuring an ample number of observed variables for a comprehensive analysis.

Crucial indices further corroborate the model's stability and reliability. The Goodness of Fit Index (GFI) stands at 0.952, the Tucker-Lewis Index (TLI) registers 0.991, and the Comparative Fit Index (CFI) reaches 0.992. Notably, all of these values surpass the recommended benchmark of 0.90, providing compelling evidence of the model's strong concordance with the observed data. This is in strict accordance with the established guidelines proposed by leading scholars in the field such as Hu and Bentler (1999), Kline (2015), and Byrne (2010). Additionally, the Root Mean Square Error of Approximation (RMSEA) is calculated as 0.028, which falls well within the highly recommended range of less than 0.05. This result firmly validates the adequacy and suitability of the model's specifications, offering a high level of confidence in the model's ability to accurately represent the underlying constructs of boundary-spanning leadership within the context of Dalian's applied universities.

Convergent Validity: The results presented in the research further confirm the convergent validity of the proposed model. Through a series of rigorous analyses, the researcher obtained significant evidence. The Average Variance Extracted (AVE) values for each of the five components of the boundary - spanning leadership model, namely Inspiration, Foresight, Decisiveness, Integration, and Resilience, were calculated. It was found that all these AVE values surpassed the critical threshold of 0.5. This indicates that the variance in the latent constructs is well explained by the corresponding observed variables.

Moreover, the Composite Reliability (CR) values for all the constructs were determined. All of them were greater than 0.7, which complies with the established standards for high internal consistency as suggested by previous research (e.g., Hair et al., 2019). This demonstrates that the items within each construct are highly interrelated and work together effectively to measure the intended constructs.

In conclusion, these results comprehensively validate that the indicators accurately represent the underlying constructs of the boundary - spanning leadership model. The model thus showcases a high level of reliability and internal coherence, providing a solid foundation for its application in the context of higher education administration in Dalian's applied universities.

Research Discussion

The research findings reveal that the boundary - spanning leadership model for higher education administrators of applied universities in Dalian is highly congruent with both theoretical underpinnings and empirical evidence. The model's validity is firmly established by strong confirmatory index values (χ^2/df = 1.309, df = 130, p < 0.01, GFI = 0.952, TLI = 0.991, CFI = 0.992, NFI = 0.967, RMSEA = 0.028), indicating an outstanding fit with the observed data. Furthermore, the Average Variance Extracted (AVE) values for all five components - Inspiration, Foresight, Decisiveness, Integration, and Resilience - exceed the 0.5 benchmark, and the Composite Reliability (CR) values are above 0.7, corroborating the model's robustness and practical significance. These outcomes emphasize the model's suitability for addressing the evolving demands of the higher education landscape in Dalian.

The effectiveness of this model stems from its focus on key leadership competencies that are essential for promoting collaboration and innovation across boundaries. The Inspiration component encourages the exchange of knowledge and ideas, fostering a culture of creativity and learning. This aligns with previous research highlighting the importance of motivation and vision

in leadership (Kouzes & Posner, 2012). The Foresight component, with its ability to anticipate trends and set clear goals, is in line with studies emphasizing strategic thinking in leadership (Mintzberg, 1994).

The Decisiveness component enables efficient decision - making processes across different departments and teams, which is crucial for navigating complex educational environments. This is supported by research on the role of decisive leadership in organizational effectiveness (Kotter, 1996). The Integration component promotes seamless cooperation among diverse groups, enhancing institutional synergy. This resonates with studies on the significance of integration in achieving organizational coherence (Hofstede, 2001).

The Resilience component equips administrators to adapt to changing circumstances and overcome challenges, which is vital in the dynamic higher education sector. This is consistent with research on the importance of resilience in leadership (Goleman, 1995).

The broader implications of the boundary - spanning leadership model on institutional performance are well - documented in the literature. For example, studies by Prysor & Henley (2017) and Hill (2023) emphasize the positive impact of effective boundary - spanning leadership on promoting innovation and improving educational outcomes. This is directly related to the model's ability to foster cross - departmental and cross - institutional collaboration.

In conclusion, the boundary - spanning leadership model, with its emphasis on Inspiration, Foresight, Decisiveness, Integration, and Resilience, provides a comprehensive and practical framework for enhancing the leadership capabilities of higher education administrators in Dalian's applied universities. These components and their associated indicators serve as valuable guidelines for administrators aiming to improve institutional effectiveness, promote innovation, and adapt to the changing higher education environment. The research findings further reinforce the significance of boundary - spanning leadership in advancing the development of higher education institutions in Dalian and potentially beyond.

Research Recommendation

Recommendation for Policy Formulation

1. Educational policymakers should formulate policies that encourage interdisciplinary collaboration:

To achieve a certain goal (presumably enhancing boundary-spanning efforts), financial incentives and resources should be provided for joint research projects among different departments and faculties. One way is to establish special funds for interdisciplinary research. This helps administrators allocate resources better and encourages faculty to collaborate across boundaries. Additionally, universities can be required to report regularly on their interdisciplinary activities to ensure transparency and accountability in promoting such efforts.

2. Leadership training programs should be integrated into the professional development framework for university administrators.

Leadership training programs should center around developing the five key aspects of boundary - spanning leadership: Inspiration, Foresight, Decisiveness, Integration, and Resilience. Policy guidelines could mandate that administrators attend such training regularly and institutions should provide enough funds. The training would cover case studies of successful boundary - spanning leadership from both domestic and international sources and practical exercises to improve skills like conflict resolution and cross - boundary communication.

3. Policies should be designed to promote the sharing of best practices among different applied universities in Dalian.

To promote the sharing of best practices among different applied universities in Dalian, several actions can be taken. These include organizing regular conferences or seminars for administrators to exchange experiences, establishing an online platform for spreading successful leadership models and strategies, and having educational authorities commission research projects to explore and document effective local practices for policy refinement.

4. In the context of university evaluation and accreditation, a greater emphasis should be placed on boundary-spanning leadership outcomes.

Evaluation criteria should involve aspects like the degree of interdisciplinary collaboration, the effectiveness of cross-boundary decision-making, and the institution's adaptability to changes. This would make universities focus on developing boundary-spanning leadership skills among administrators and allocate resources appropriately.

5. Policies should support the establishment of partnerships between universities and external stakeholders, such as industries and local communities.

To support university-industry collaborations, tax incentives or other forms of support can be provided. For instance, policies can promote the establishment of joint research centers or internship programs. These initiatives enhance the practicality of university education and develop boundary-spanning leadership skills among administrators via real-world interactions. Implementing such policies can transform Dalian's educational environment, helping it face modern challenges and improve the effectiveness of applied universities.

Recommendation for Practical Application

1. Inspiration

University admins should organize seminars/workshops with experts from various fields. This can expand knowledge and inspire new research/teaching methods. For instance, an engineering and design dept. can jointly hold a seminar. Also, set up an "Innovation Incentive Fund" to support creative multi-disciplinary projects.

2. Foresight

Set up a "Future Trends Research Center" with admins, faculty from different disciplines, and industry reps. It researches emerging tech, social needs, and policy trends. Admins should also encourage faculty to attend international conferences and exhibitions and share experiences.

3. Decisiveness:

Develop a "Boundary-Spanning Decision-Making Procedure Manual" for clear processes and responsibilities in cross-disciplinary issues. Strengthen communication with faculty and students when making decisions.

4. Integration:

Create a "Boundary-Spanning Collaboration Platform" using IT to break departmental barriers and facilitate resource sharing. Promote joint development of interdisciplinary courses.

5. Resilience:

Organize "Crisis Simulation Exercises" to improve response and adaptation. Establish a "Resilience Support Network" with internal and external resources for support during difficulties.

Recommendation for Future Research

For further research on boundary-spanning leadership for administrators in Dalian's applied universities, three suggestions are proposed:

Firstly, conduct in-depth comparative research among different applied universities considering size, location, and specialization. Compare engineering-focused ones with those in business or arts, and also include traditional universities. Analyze the influence of institutional cultures and strategic priorities on the leadership model. Use case studies and data collection to understand variations and provide tailored guidance.

Secondly, initiate longitudinal studies following students from enrollment to early career. Employ surveys, interviews, and performance assessments to measure employability skills development. Track students' participation in interdisciplinary activities and explore the relationship between leadership and innovation. Establish causal links to prove the importance of boundary-spanning leadership.

Finally, explore effective strategies for developing such leadership skills. Design and evaluate training programs with simulations, case analyses, and workshops. Investigate on-the-job experiences, coaching relationships, and identify developmental milestones. Develop metrics to measure progress and offer practical recommendations.

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