

THE MEDIATING ROLE OF KNOWLEDGE SHARING BETWEEN TRANSFORMATIVE LEADERSHIP AND INNOVATIVE WORK BEHAVIOR: A CASE OF CHINESE UNDERGRADUATE COLLEGES

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Abstract

Background: China's application-oriented undergraduate universities are undergoing transformation, but there are still many obstacles to development, and innovation has become an urgent need for transformation. According to social exchange theory and knowledge base view, knowledge management becomes an important antecedent of innovation as an organization that produces and disseminates knowledge. Transformational leadership also plays an important role in promoting innovative work behavior. **Objective:** To assess the impact of transformational leadership on knowledge sharing and innovative work behavior, and to assess the mediating role of knowledge sharing between transformational leadership and innovative work behavior. **Method:** An online questionnaire survey was conducted on 400 samples from more than 12 applied universities in Sichuan Province, and the partial least square structural equation model was used to analyze the research objectives. **Findings:** Transformational leadership has a positive effect on innovative work behavior; Transformational leadership has a positive impact on knowledge sharing; Knowledge sharing has a positive effect on innovation work behavior. Knowledge sharing has a partial mediating effect between transformational leadership and innovative work behavior. **Contribution:** This study expands the theoretical understanding of transformational leadership and innovative work behavior, and extends the research scope to the field of higher education. In practice, it also has certain reference value.

Keywords: Transformative Leadership, Knowledge Sharing, Knowledge Sharing, Mediating Role

1. INTRODUCTION

With the implementation of the national innovation strategy, China's undergraduate universities have collectively transformed into application-oriented undergraduate universities since 2015 to adapt to the structural adjustment of industrial upgrading. However, there are still many problems in the application transformation: for example, "application education" is difficult to internalize into practice, and it is difficult to have a consciousness of teachers' behavior (Guo, 2017). "School-enterprise cooperation" has not really brought into play practical effects (Hu & Liu, 2019), and internal implementation of organizational change is confronted with obstacles such as system, team, culture, and platform (Pan et al., 2021). Lack of interactive integration and harmonious symbiosis between systems inside and outside universities (Z. Chen, 2020), faculty members do not support and resist (Yang, 2018), teachers are weak in "applied research" and generally lack the research ability to solve practical

problems of enterprises (Cai et al., 2019). In his theory of innovation, Schumpeter emphasized the importance of entrepreneurship, not only in business, but also in education. The cultivation of teachers' innovative consciousness is the primary factor affecting the innovation of colleges and universities (K. Chen, 2007). People should all be able to think creatively and use this creativity to deal with the challenges that arise in the real world, so it is necessary to train and build a large number of teachers with innovative consciousness (Fan, 2019). However, some factors affect the innovative vitality of teachers, such as the lack of respect, encouragement and stimulation of teachers' innovative vitality, and even the lack of effective guidance and system and mechanism (Han, 2016). Lack of culture to promote and create change. Studies have shown that transformational leadership has a strong impact on organizational innovation culture (Yang, 2018). Transformational leadership can motivate teachers to propose new ideas and concepts (Khan et al., 2020). The key link of application-oriented transformation is the integration of production, education and teaching (Cai et al., 2019). According to the "triple helix" theory, resource sharing and information communication among universities, industry and government is a prerequisite. Some universities and enterprises have begun to develop knowledge management platforms (Fan, 2018). In this context, the knowledge sharing behavior of university faculty and staff has also come into our view. Knowledge sharing includes not only within the organization, but also the absorption of external information.

Our underlying theories are Social Exchange Theory (SET) and Knowledge-Based View (KBV). George Homans believes that all social interaction can be understood as an exchange relationship (Muldoon et al., 2018). Individuals are the main producers of new information and the main stores of existing knowledge, they must apply a variety of knowledge in production, and they must pay attention to and supervise the management of the integration of professional knowledge and personal skills into work tasks in the cooperative unit (Grant, 1997). There is a social exchange relationship between transformational leaders and staff, and knowledge sharing is not only an important part of knowledge management, but also the main way to absorb and exchange information. Therefore, based on SET and KBV, we propose a conceptual framework composed of transformational leadership, knowledge sharing and innovative work behavior, and determine the research objectives of this study:

- Objective1: To assess the Relationship between Transformational Leadership (TL) and Innovative Work Behaviors (IWB).
- Objective2: To assess the Relationship between Transformational Leadership (TL) and Knowledge Sharing (KS).
- Objective3: To assess the direct relationship between Knowledge Sharing (KS) and innovative work behaviors (IWB).
- Objective4: To assess the mediating effect of Knowledge Sharing (KS) on Transformational Leadership (TL) and Innovative Work Behavior (IWB).

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Innovative work behavior (IWB)

The concept of innovative work behavior, first proposed by West & Farr(1989), refers to the purposeful development, sharing, and application of new ideas in a team or organization to improve role performance, team, or organization (Tura & Akbasli, 2022). Its concept has the following connotations:

Innovative work behaviors include the generation (introduction) and application of new ideas by individual employees. IWB is the conscious creation, introduction and application of new ideas within a job role, team or organization. IWB is considered a complex behavior consisting of three distinct tasks: idea generation, idea promotion, and idea realization (Janssen, 2000b). This definition restricts innovative behavior to conscious effort (Janssen, 2000a). Afsar also focuses on innovation generation and idea implementation. He points out that IWB transcends the concept of initiative throughout the entire process of innovation, including the generation of ideas based on the need for innovation (Afsar et al., 2014). It involves skills like problem-solving, creativity, initiative, and coming up with novel ways to complete tasks at work (Afsar & Masood, 2018). Innovative work behaviors also include risk-taking, which may involve a combination of existing ideas or genuinely new ideas (Shih & Susanto, 2011). It is characterized by creativity, a spirit of risk-taking and the ability to think outside the box to solve problems and drive innovation (Rafique et al., 2022).

2.2 Transformational leadership (TL)

Burns was the first to separate transformational leadership from transactional leadership and to develop the idea of transformational leadership. (Gad David et al., 2023). Bass was one of the early scholars to clearly define transformational leadership: a transformational leader explains the importance of the task to subordinates, motivates subordinates to recognize the importance of achieving the collective good, and expects high performance from subordinates (Bass, 1985).

Transformational leadership is a style of leadership that focuses on inspiring followers to reach their full potential and exceed their expectations. It involves creating a vision, setting high expectations, and providing support and guidance to help followers grow and develop (Bass et al., 2003). This leadership style has some basic characteristics: motivating others through personal charisma, idealized influence, intellectual stimulation, individualized consideration, inspirational motivation (Simi, 1999) (Bass et al., 2003) (Stanescu et al., 2021) (Rafique et al., 2022) (Karimi et al., 2023). Positive, empowering work cultures where followers feel appreciated and inspired to put out their best efforts are made possible by transformational leaders (Judge & Piccolo, 2004). Personal attention to the requirements of each individual worker, personalized care and direction, and addressing those needs are all hallmarks of transformational leadership (Stanescu et al., 2021), Serve as an instructor, mentor, coach, and facilitator for others (Korku & Kaya, 2023), enhances followers' trust, loyalty, and dedication while inspiring and empowering them (Afsar et al., 2019).

2.3 Knowledge sharing (KS)

A department's or organization's culture of social interaction involving the sharing of employees' knowledge, experience, and abilities among themselves is known as knowledge sharing (H. Lin, 2007). It is impossible to overestimate his significance; knowledge within an organization is inevitably increased through the sharing of information, expertise, and experiences at work (Kmieciak, 2020). This, in turn, increases intellectual capital and has a major impact on performance and innovation (Abukhait et al., 2023). While information sharing does happen at the individual level, it also happens within organizations. Inter-organizational knowledge exchange is critical in the age of open innovation. An essential component of organizational performance is the transfer of knowledge both inside and beyond the group (Cummings, 2004). Within an organization, explicit knowledge sharing refers to the process of exchanging codified knowledge that can be recorded and distributed. Documents, reports, procedures, rules, and manuals may contain references to this knowledge. Sharing of personal knowledge that is hard to put into words or symbols is known as tacit knowledge sharing (Wang et al., 2016).

2.4 Transformational leadership and Innovative work behavior (TL-IWB)

Transformational leadership creates a positive, empowering work environment (Judge & Bono, 2000). Team members are empowered and developed (Eisenbeiss et al., 2008). They are actively involved in learning, facilitating follower learning, conducting trainings, and providing the necessary support to overcome barriers and build a culture of learning (Jesus Garcia-Morales et al., 2012). Promoting a culture of collaboration and innovation encourages followers to think creatively and take risks (Masood & Afsar, 2017). They inspire and empower followers, fostering a sense of trust, loyalty, and commitment (Afsar & Umrani, 2019). Followers are encouraged to challenge the status quo and innovate (Stanescu et al., 2021). Communicate with followers during the decision-making process to enhance the climate of innovation (Korku & Kaya, 2023). These behaviors of transformational leaders tend to create enthusiasm and positive identification of employees with their job roles. However, there are also studies that show that transformational leadership has no significant direct impact on innovative work behavior (Udin & Shaikh, 2022). Therefore, we propose the following hypothesis:

H1: Transformational Leadership is Positively Correlated with Innovative work behavior

2.5 Transformational leadership and knowledge sharing (TL-KS)

Transformational leadership (TL) and knowledge sharing (KS) are considered to be key sources of fostering innovation and achieving competitive advantage. TL is considered to be one of the most effective styles of leadership, which positively influences innovation capability through intellectual stimulation and motivating innovative behaviors among employees. TL is considered essential to create a positive environment that encourages employees to practice, gather and share knowledge (P. B. Le & Lei, 2019a). Transformational leadership is the promoter of knowledge sharing. High level transformational leadership is more active than low

level transformational leadership (Wu & Lee, 2020). B. P. Le tested two different dimensions of knowledge donation and knowledge collection respectively, and the results also showed that TL had a positive influence on KS (B. P. Le et al., 2018). Other studies have also shown that TL has a positive effect on KS (Phong, 2021) (M. Nguyen, 2023). Therefore, we propose the following hypothesis:

H2: Transformational Leadership is Positively Correlated with Knowledge Sharing

2.5 Knowledge sharing and Innovative work behavior (KS-IWB)

Workers that are willing to share their knowledge are more likely to be involved in the development, promotion, and use of innovations. This can be achieved through information sharing and idea exchange. Knowledge-sharing staff members can enhance their sense of self-worth by valuing traits including competence, aptitude, abilities, and trust (Muhammed et al., 2020). According to (Radaelli et al., 2014), the exchange of knowledge promotes the restructuring and articulation of existing knowledge, hence fostering the creation, spread, and utilization of novel concepts. Employees' KS behaviors improved their creative work practices (Akhavan et al., 2015). The research also shows that the influence of knowledge collection on employees' innovative work behavior is greater than that of knowledge donation, both of which have positive and significant effects (Akram et al., 2018). Therefore, we propose the following hypothesis:

H3: Knowledge Sharing is positively related to Innovative Work Behavior

2.6 Knowledge sharing plays a mediating role between transformational leadership and innovative work behavior (TL-KS-IWB)

Although knowledge sharing (KS) plays a major role in forming innovative organizations, the factors that promote or inhibit KS are not well recognized and researched. They make the case for the necessity of looking into the processes through which KS acts as a mediator between TL and creative behavior. KS and leadership qualities are acknowledged as some of the most important group resources. Consequently, investigating the ways in which TL and KS impact different facets of innovation aptitude (such as process and product innovation) will aid in offering practical answers or the best course of action for gaining each distinct kind of innovation capability (P. B. Le & Lei, 2019b).

Accordingly, Choi investigates the mediators and moderators that exist between TL and employee innovation behavior. It needs a group vision to share knowledge. By offering this collaboration, transformational leaders obliquely assist IWB(Choi et al., 2016). The desire of employees to share knowledge is a prerequisite for realizing knowledge sharing, but employees often view knowledge sharing negatively because they are afraid of losing knowledge sharing. TL is very helpful in overcoming this obstacle(Aydin & Erkilic, 2020). Therefore, we propose the following hypothesis:

H4: Knowledge Sharing Mediates Transformational Leadership and Employee Innovative Work Behavior

3. METHOD

3.1 Sample and Data Collection

This study selected the faculty and staff of 12 applied universities in Sichuan Province of China as the investigation objects. These faculty members include full-time teachers, administrators, and full-time researchers. Based on the total number of faculty and staff of the surveyed university (13,563), the sample size is calculated to be 388 people according to Taro Yamane (Taro, 1973)'s sampling formula. In order to prevent the margin of incomplete data or invalid responses, the sample size was expanded, and after data cleaning, the final sample was 400. Data collection was conducted in the form of online surveys.

3.2 Variable Measurement

All measurement tools used in this study were derived from scales developed and applied by the researchers in the past. TL was measured using the Multifactor Leadership Questionnaire (MLQ 5X-short) developed by (Avolio & Bass, 1995). The measurement tool of KS is from (Van Den Hooff & De Ridder, 2004). The measurement tool of IWB is from (Janssen, 2000a).

These scales are measured in a second-order structure. We did a 50-sample pilot study using these scales to test scale quality, and some items were removed, but all first-order constructs were identical to the original scale. The dimensions of TL include Idealized Influence Attributes (IIA), Idealized Influence Behaviors (IIB), Inspirational Motivation (IM), Intellectual Stimulation (IS), Individual Consideration (IC). The dimensions of KS include Knowledge donating (KD) and Knowledge collecting (KC). The dimensions of IWB include Idea generation (IG), Idea promotion (IP), and Idea realization (IR).

Five-point Likert scale was used. 1=Not at all, 2=Once in a while, 3=Sometimes, 4=Fairly often, 5=Frequently, if not always.

3.3 Data Analysis Method

The partial least squares (PLS) - structural equation modeling (SEM) method was used to quantitatively analyze the data. The measurement model and the structural model are evaluated in two stages. The analysis software uses Smart-PLS V4.0.8.7.

4. DATA ANALYSIS AND RESULTS

4.1 Measurement model

Unreliable measurements will never be valid because we cannot distinguish between systematic and random errors (Mooi & Sarstedt, 2011). The measurement model in this study is reflective model, as shown in Figure 1. We need to assess internal consistency, reliability, and validity.

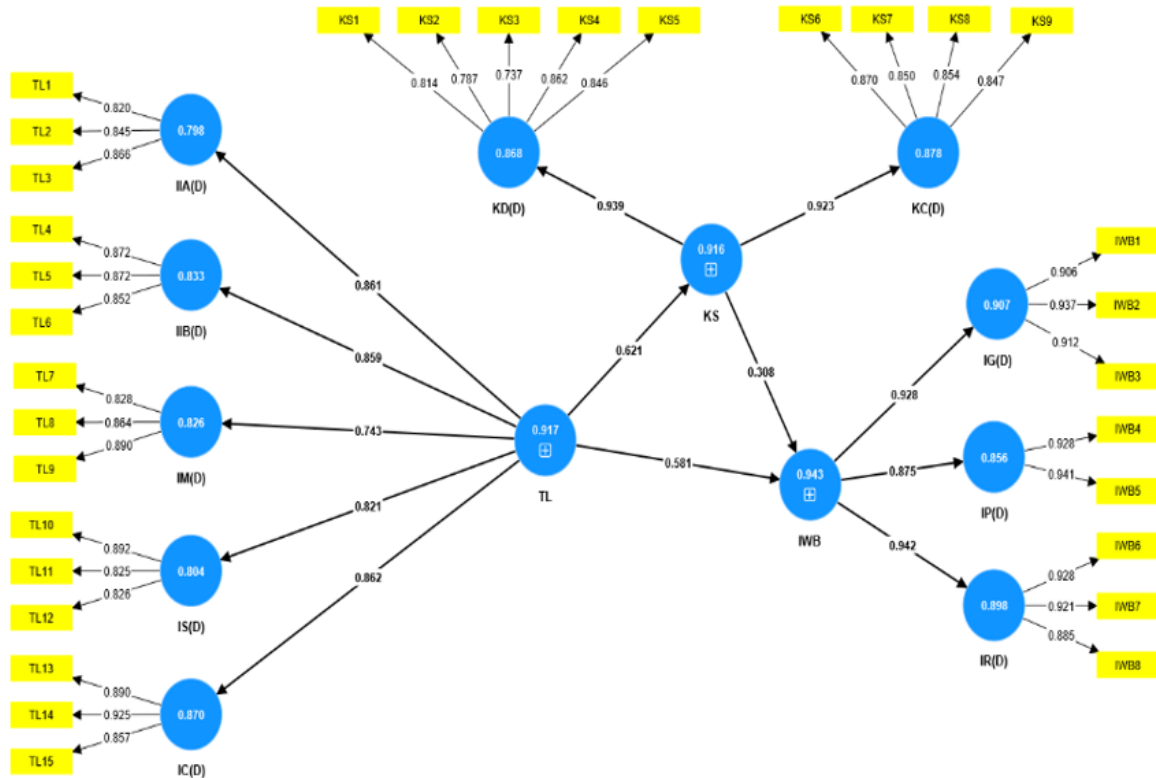


Figure 1: Cronbach's α (Constructs), Path coefficients (Inner model) and Outer loading (Outer model)

4.1.1 Internal Consistency

Cronbach's alpha tends to underestimate the reliability of internal consistency since it is sensitive to the items in the scale. It can be applied as a more cautious internal consistency reliability metric. Technically speaking, it is more reasonable to use a separate internal consistency reliability measure that accounts for the various outer loading of the indicator variables—composite reliability (Hair, 2022).

The first criterion to be evaluated is usually internal consistency reliability. The traditional standard for internal consistency is Cronbach's alpha, where a value greater than 0.7 indicates good internal consistency. As shown in Table 1, Cronbach's alpha values for all first-order constructions are above 0.7. As shown in Table 2, Cronbach's alpha values of all second-order constructions are above 0.9.

There are 0 to 1 composite reliability values. A higher reliability is indicated by a larger value. It is frequently taken to be the same as Cronbach's alpha. More specifically, a composite reliability value of 0.70 to 0.90 can be deemed satisfactory in more advanced research, whereas a value of 0.60 to 0.70 is acceptable in exploratory study (Hair, 2022). As shown in Table 1 and Table 2, CR values are above 0.8, indicating high reliability.

4.1.2 Convergent validity

The high degree of convergent effectiveness shows that this set of indicators really measures the theoretical concept itself, not other variables. Convergence validity is the basic basis for evaluating construction validity. The criterion is mean variance extraction (AVE) > 0.5 (Fornell & Larcker, 1981) (Hair et al., 2009). As shown in Table 1 and Table 2, AVE values of both first-order constructs and second-order constructs exceed 0.5, indicating that the measurement data has good convergence validity.

Table 1: Reliability and validity of first-order constructs

First Order Constructs	Items	Loadings	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
IIA(D)	TL1	0.820	0.798	0.801	0.712
	TL2	0.845			
	TL3	0.866			
IIB(D)	TL4	0.872	0.833	0.838	0.749
	TL5	0.872			
	TL6	0.852			
IM(D)	TL7	0.828	0.826	0.834	0.742
	TL8	0.864			
	TL9	0.890			
IS(D)	TL10	0.892	0.804	0.809	0.719
	TL11	0.825			
	TL12	0.826			
IC(D)	TL13	0.890	0.870	0.871	0.794
	TL14	0.925			
	TL15	0.857			
KD(D)	KS1	0.814	0.868	0.872	0.657
	KS2	0.787			
	KS3	0.737			
	KS4	0.862			
	KS5	0.846			
KC(D)	KS6	0.870	0.878	0.878	0.732
	KS7	0.850			
	KS8	0.854			
	KS9	0.847			
IG(D)	IWB1	0.906	0.907	0.908	0.844
	IWB2	0.937			
	IWB3	0.912			
IP(D)	IWB4	0.928	0.856	0.862	0.874
	IWB5	0.941			
IR(D)	IWB6	0.928	0.898	0.900	0.831
	IWB7	0.921			
	IWB8	0.885			

Table 2: Reliability and validity of second-order constructs

Second Order Constructs	Dimension Code	Loadings	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
TL	IIA(D)	0.861	0.917	0.919	0.547
	IIB(D)	0.859			
	IM(D)	0.743			
	IS(D)	0.821			
	IC(D)	0.862			
KS	KD(D)	0.939	0.916	0.917	0.599
	KC(D)	0.923			
IWB	IG(D)	0.928	0.943	0.944	0.716
	IP(D)	0.875			
	IR(D)	0.942			

4.1.3 Discriminant validity

In the past, we often used the "Fornell-Larcker criterion" and "Cross loading" to test the discriminative validity. But it's not very accurate (Henseler et al., 2015). Henseler proposed a new measure of discriminative validity called "the HTMT ratio of correlations". According to Henseler, the threshold is 0.90 if the path model includes conceptually highly comparable structures. As shown in Table 3 and Table 4, the HTMT values of both first-order structure and second-order structure are less than 0.9, indicating that each construct has good discriminative validity.

Table 3: HTMT of first-order constructs

	IC(D)	IG(D)	IIA(D)	IIB(D)	IM(D)	IP(D)	IR(D)	IS(D)	KC(D)
IC(D)									
IG(D)	0.721								
IIA(D)	0.788	0.667							
IIB(D)	0.791	0.685	0.827						
IM(D)	0.745	0.606	0.799	0.775					
IP(D)	0.653	0.809	0.658	0.685	0.561				
IR(D)	0.740	0.887	0.695	0.722	0.690	0.869			
IS(D)	0.661	0.693	0.738	0.807	0.734	0.674	0.747		
KC(D)	0.575	0.665	0.566	0.549	0.511	0.665	0.632	0.572	
KD(D)	0.618	0.644	0.582	0.575	0.519	0.675	0.625	0.560	0.841

Table 4: HTMT of first-order constructs

	IWB	KS	TL
IWB			
KS	0.718		
TL	0.827	0.676	

4.2 Structural model

4.2.1 Collinearity evaluation

To evaluate the structural model, we must first determine the collinearity, otherwise it is easy to cause the interpretation deviation of the model, and the reflection model only diagnoses the internal collinearity between variables. A VIF value greater than 5 is the critical level of collinearity (Hair, 2017).

As shown in Table 5, VIF values of internal models are no more than 3, indicating that there is no problem of co-occurrence of constructs in the structural model, which will not adversely affect the estimation of the path coefficient of the structural model.

Table 5: Inner model collinearity diagnosis (VIF)

	IC(D)	IG(D)	IIA(D)	IIB(D)	IM(D)	IP(D)	IR(D)	IS(D)	IWB	KC(D)	KD(D)	KS	TL
IC(D)													
IG(D)													
IIA(D)													
IIB(D)													
IM(D)													
IP(D)													
IR(D)													
IS(D)													
IWB		1				1	1						
KC(D)													
KD(D)													
KS									1.626	1	1		
TL	1		1	1	1			1	1.626			1	

4.2.2 Hypothesis testing

In this study, double-tail test was selected to run bootstrapping (5000), the significance level was 0.05, and the critical value of T-value was 1.96. The result is shown in Table 6 and Table 7.

Direct effect. As shown in Table 6, the T value of the constructs involved in the three direct hypotheses all exceeded 1.96, the P-value < 0.001, and the bootstrap confidence interval did not contain 0, indicating that three relationships are significant at the 5% level.

Table 6: Direct effect

	Relations	Beta	STDEV	T statistics	P values	2.50%	97.50%
H1	TL -> IWB	0.581	0.044	13.241	0.000	0.494	0.664
H2	TL -> KS	0.621	0.032	19.096	0.000	0.552	0.680
H3	KS -> IWB	0.308	0.046	6.686	0.000	0.216	0.395

Indirect effect. Table 7 presents data on indirect effects. At the significance level of 0.05, the two-tail test was performed by bootstrapping. The T-values of H4 with mediating variables is greater than 1.96, and the p-values. The self-help confidence interval does not contain 0, indicating that the path is significant at the 5% level.

Table 7: Indirect effect

Hypothesis	Relations	Beta	STDEV	T statistics	P values	2.50%	97.50%
H4	TL -> KS -> IWB	0.191	0.029	6.554	0.000	0.046	0.158

Types of Mediation Effects

According to Hair's classification, we refer to mediations where both direct and indirect effects are based on statistical significance as complementary mediations (Hair, 2022). Knowledge sharing obviously belongs to the complementary mediating effect (partial mediation).

Total effects

As shown in Table 8, when knowledge sharing is used as the mediating variable, we can calculate that the total effect of this relationship is 0.772 (0.581+0.191).

Table 8: Total effects

Hypothesis	Relations	Direct effects	Indirect effects	Total effects
H1	TL -> IWB	0.581	-	-
H2	TL -> KS	0.621	-	-
H3	KS -> IWB	0.308	-	-
H4	TL -> KS -> IWB	0.581	0.191	0.772

Model interpretation ability

The value of R² varies between 0 and 1, and the closer to 1 the greater the explanatory power. A significant result usually appears around 0.670, while a value around 0.333 is considered a medium equivalent and a value around 0.190 is considered a weak value. A minimum value of 0.10 is considered acceptable (Marcoulides, 1998). For f² values, the degree to which a variable has a significant effect on the underlying variable. 0.020, 0.150, and 0.350 indicate the low, medium, or large impact of the predictor within the structural model (Hair et al., 2021). In the model of this study, the R² value of construct TL and KS for IWB is about 0.67, which is a significant result. The R² value of TL for KS is 0.385, which belongs to the medium effect. In terms of structural relationship strength, TL has the greatest influence on KS and IWB, while the relationship strength between KS and IWB is weak.

Table 9: Model interpretation ability (R² and f²)

Independent latent variable	Dependent latent variable	R ²	R ² adjusted	f ²
TL	KS	0.385	0.383	0.626
TL	IWB	0.653	0.652	0.598
KS	IWB	0.653	0.652	0.168

5. DISCUSSION

5.1 Transformational leadership has a positive impact on innovative work behavior

The results showed that transformational leadership had significant effects on innovative work behavior at 0.05 significance level ($\beta=0.581$, $T=13.241$, $P < 0.001$). The idea that transformational leadership is about bringing about change and innovation—innovation being defined as "the intentional introduction and application of ideas, processes, products, or

procedures that are unfamiliar to the relevant adopting unit within a role, group, or organization, and that are designed to significantly benefit an individual, group, organization, or wider society"—is a recurring theme in the literature on leadership (Eisenbeiss et al., 2008). Transformational leaders frequently demonstrate traits including setting an example for followers, offering personalized assistance and direction, and conveying a clear and upbeat vision. Positive effects of transformational leadership include creative work practices and employee well-being at work (Alwahhabi et al., 2023). Although the results of this study support multiple studies (Korku & Kaya, 2023) (Helmy et al., 2023) (Rafique et al., 2022), there are also different opinions. Sudibjo's research results show that transformational leadership has no direct positive impact on teachers' innovative work behavior (Sudibjo & Prameswari, 2021). Udin's research on enterprises also shows that transformational leadership has no significant direct impact on innovative work behavior (Udin & Shaikh, 2022). This is a topic worth exploring.

5.2 Transformational leadership has a positive impact on knowledge sharing

The results showed that transformational leadership had significant influence on knowledge sharing at 0.05 significance level ($\beta=0.621$, $T=19.096$, $P < 0.001$). Not only has the correlation between TL and KS been validated within corporate settings, but Lin also employed this set of ideas to examine the relationship between educators and learners, arriving at a similar conclusion: a high level of transformational leadership may lessen the reluctance of individuals with neurotic characteristics to impart knowledge. This has a major favorable effect on information sharing, particularly for people who are considered extroverted and obedient (K.-J. Lin et al., 2018). If testing the two dimensions of knowledge sharing separately, both dimensions of knowledge sharing—knowledge collection and knowledge donation—have a positive impact on cause IWB (K. Nguyen et al., 2019). The results of this paper are consistent with the above studies.

5.3 Knowledge sharing has a positive impact on innovative work behavior

The results showed that knowledge sharing had significant effects on innovative work behavior at 0.05 significance level ($\beta=0.308$, $T=6.686$, $P < 0.001$). For the influence of knowledge sharing on innovative work behavior, some mechanisms have been understood by researchers. For example, enhancing the sharer's sense of self-worth (Muhammed et al., 2020), providing support through knowledge self-efficacy and technology use (K. Nguyen et al., 2019), Improved information sharing and psychological empowerment, increased control over work (Simatupang et al., 2022), self-leadership (Asurakkody & Kim, 2020), and improved innovation efficiency (Akram et al., 2018). All these studies affirm the positive impact of knowledge sharing on innovation and reveal some mechanisms. The reasons excavated in the qualitative research part of this study support the above research conclusions.

5.4 Knowledge sharing is an intermediary between transformational leadership and innovative work behavior

The results show that knowledge sharing has a partial mediating effect between transformational leadership and innovative work behavior. The relative importance of analyzing relationships is crucial to interpreting results and drawing conclusions. The path coefficient, in Hair's opinion, represents the degree to which the exogenous structure is related to the endogenous structure and is statistically significant (Hair et al., 2009). As shown in Table 7, the indirect effect of KS is weak, but Table 8 shows the total effect of TL-IWB is strong (0.772), and a large part of it is the influence of TL on KS. This mediating effect is partial, indicating that KS is not a decisive factor between transformational leadership and innovative work behavior, but it still has strong practical significance. In the process of knowledge management, KS is crucial. The traits and behaviors of leaders have a big influence on whether or not employees' KS behaviors are encouraged. In order to establish and preserve a pleasant work environment (KS) among employees in an organization, leadership support is essential (P. B. Le & Lei, 2019b). Transformational leadership indirectly helps IWB by providing teamwork. Employees' intrinsic desire to share information and encourage the development of experiences is now amplified by transformational leaders, and information sharing plays a mediating role in this relationship (Choi et al., 2016).

6. CONCLUSIONS

In this study, 400 samples from 12 applied universities in China were selected and evaluated using the least squares structural equation model. The results show that all hypotheses are supported. Knowledge sharing plays an intermediary role between transformational leadership and employees' innovative work behavior. This study extends the theoretical understanding of transformational leadership and innovative work behavior, and extends the research scope to the field of higher education. In practice, it also has certain reference value: In order to cope with the high requirements for teacher innovation in the process of university transformation, university leaders should cultivate transformational leadership style, attach importance to knowledge management, cultivate a good learning and innovation culture, strengthen external communication and absorption, support staff knowledge sharing, and have a positive impact on staff innovation.

7. LIMITATIONS AND RESEARCH PROSPECTS

The area is limited to Sichuan Province in China, and can be expanded to other areas in the future; The conceptual framework can introduce additional variables to explore the topic in depth; There are conflicting views on the relationship between TL and IWB, and it is worth continuing to expand in different areas. TL on KS and the mechanism of action between the two needs further study.

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