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Original Article

Driving Innovation in Education: The Role of Transformational Leadership and Knowledge Sharing Strategies

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Abstract:
This study aimed to investigate the impact of transformational leadership by educational institution managers on innovation in education, with a focus on the mediating role of knowledge sharing. A total of 138 faculty members and staff from higher education institutions in Iran participated in the research. Data analysis utilized partial least squares structural equation modeling (PLS-SEM) with SMARTPLS3 software. The findings indicated that transformational leadership by educational institution managers has a significant and positive impact on knowledge sharing and innovation in education. Additionally, the impact of knowledge sharing on innovation in education was also found to be significant and positive. The mediating role of knowledge sharing in the impact of transformational leadership by educational institution managers on innovation in education was also significant and positive. Therefore, it can be concluded that transformational leadership by educational institution managers leads to increased innovation in education through knowledge sharing.

Keywords: Transformational Leadership, Knowledge Sharing, innovation in education, Educational Institutions

Introduction

Innovation is a fundamental component of organizations and educational institutions, so much so that it can be said they are doomed to perish without implementing change (Hatami and Nasiri Valik Bani, 2019). In a competitive world, innovation is not only essential for the growth of organizations but also crucial for their survival (Hoang et al., 2022 ; Heidari et al., 2023). New ideas and methods quickly replace old approaches, and change and transformation have become the norm. Today's organizations require rapid and continuous innovation in products, services, technologies, and processes. Due to rapid changes and intense competition, companies have no choice but to innovate (Sadeghi et al., 2022; Zandi & Luhan, 2024). Companies that cannot consistently deliver innovative products and

services to the market will face failure. Therefore, the ability to continuously innovate products, services, and work processes is vital for organizations. Consequently, over the past twenty years, attention to "innovation" as a research topic has increased (Singh and Sarkar, 2019). In today's business environment, companies must continuously innovate to remain competitive in the long term. Existing environmental crises have altered conventional systems and jeopardized the survival of organizations (Karabulut et al., 2022). For instance, ineffective sanitary disposal of hospital waste can lead to environmental risks and higher operational expenses (Sabeti Karajvandani et al. 2024). In order to gain a competitive advantage and enhance their reputation, innovation is a crucial strategic choice to address crises. It is evident that innovation plays a significant role in assisting organizations to survive in a world full of changes (Su et al., 2020).

According to Manteghi (2005), the production, acceptance, and implementation of educational innovations are innovative and creative stages and aspects that lead to transformation in the traditional educational system and optimize and enhance its quality. Educational innovations are responses to changes, expectations, and experiences of students and learners, addressing the world of information, especially technological advancements by learners (Koh, 2002 ; Cuocci et al., 2023). Educational innovation entails useful products and processes that enhance the quality and outcomes of the learning process (Messmann & Mulder, 2011; Chekuri et al., 2023). Many educational institutions invest heavily in creating innovation, but they often seek the key to innovation outside the institution. In this case, despite significant investments, they may not achieve desired results. Innovation is actually created from within the institution and among managers and employees who exhibit innovative behaviors (Hashemian et al., 2024 ; Sanaei, 2024). Therefore, given the importance of innovation in education, this research examines the impact of transformational leadership of educational institution managers on innovation in education with the mediating role of knowledge sharing.

The central and crucial role of leaders in advancing organizations towards achieving set goals and ensuring organizational survival necessitates the imperative coordination, accompaniment, and direct interaction of all organizational levels with leaders. Therefore, leaders strive to create individual, group, and organizational growth and development through adopting various leadership styles tailored to the culture, maturity level, and elevation of organizations. The theory of transformational leadership is one of the prominent theoretical frameworks worldwide, introduced by Bass (1985). A transformational leader is someone who encourages followers to perform beyond the expected norms (Bass, 1985; Qu et al., 2015; Messmann et al., 2022). Burns (1978) defines transformational leadership as a process in which leaders and followers propel each other to higher levels of morality and motivation.

Leadership for transformation requires the enactment of four components or factors as constituent elements of this well-known theory. These factors include: 1) Idealized Influence: This dimension describes leaders who act as strong role models for followers. Also, pride, consideration, respect, and unwavering loyalty from followers to leadership convey a sense of idealism (Linde, 2004; Fernet et al., 2015). 2) Inspirational Motivation: This factor characterizes leaders who increase followers' commitment and motivation by involving them in creating a vision for the future (AmirKhani and Borhani, 2016). Ergenelia et al., 2007; Mittal & Dhar, 2015). Inspirational motivation requires leaders to energize and empower organizational members. 3) Intellectual Stimulation: Leaders utilizing this aspect do not tell individuals what to do but rather invest in their intellectual capital and enhance their mental abilities (Avolio & Bass, 2002).4) Individual Consideration: Individual consideration involves paying attention to the individual differences of followers, engaging with each one, and stimulating them through delegating responsibilities for their learning and experiences. It occurs when leaders serve their followers in meeting their desired needs and strive to develop their potential (Horwitz et al., 2008). Contrary to traditional leadership theories that mainly focus on rational processes, transformational leadership theory emphasizes emotions and values. Today, transformational leadership plays a crucial role in enhancing the capabilities of individuals and organizations to create, exploit, unleash, and apply

knowledge to develop the competencies necessary for organizational improvement (Grant, 2012; Mittal & Dhar, 2015). In the educational context, transformational leadership leads to empowering teachers and professors, resulting in educational innovations (Norman et al., 2024 ; Kilag et al., 2024 ; Karami et al., 2019). Research indicates the significant role of transformational leadership in innovation and educational improvement (Owusu-Agyeman, 2021; Sudibjo & Prameswari, 2021; Vermeulen et al., 2022; Kilag et al., 2024).

On the other hand, the most important asset for organizations today is the knowledge they have access to. Organizations can succeed by acquiring the most useful, reliable, and up-to-date human knowledge in their business field and using it to their best advantage (Kremer et al., 2019). One of the key priorities identified by knowledge management researchers is to create motivation in individuals to share their knowledge. Knowledge sharing, as a complex yet value-creating activity in knowledge management, forms the basis of many organizational strategies (Bhatti et al., 2021; Azimi Asmaroud, 2022; Ghorashi et al., 2015).

While some believe that knowledge is power, it seems that knowledge itself does not possess power; rather, what empowers individuals is the knowledge they share with others (Jyoti et al., 2019). In modern economics, knowledge is perceived as a strategic factor in achieving sustainable competitive advantage, but it's not just possessing knowledge assets that creates power and value (Dehghani & Larijani, 2023). Instead, it's the sharing of knowledge within and outside the organization that creates the power and value. This will lead to the creation of new and valuable knowledge assets (Zhang et al., 2020).

Effective knowledge sharing among organization members leads to a reduction in knowledge production costs and ensures the dissemination of best practices within the organization. It enables the organization to solve its problems and challenges, most importantly fostering innovation and creativity (King, 2011). Research also indicates the mediating role of knowledge sharing in the impact of transformational leadership on innovation (Sudibjo & Prameswari, 2021; Al-Husseini et al., 2021; Rafique et al., 2022).

In general, innovation is essential not only for the growth of organizations but also for their survival in a competitive world. New ideas and methods are rapidly replacing old ones, and change and transformation have become the norm. Today's organizations require continuous and rapid innovations in products, services, technologies, and processes. Due to rapid changes and intense competition, companies have no choice but to innovate. Companies that cannot continuously deliver innovative products and services to the market are destined to fail (Abbassi, 2022; Borhani et al., 2022).

Previous research indicates that the impact of transformational leadership of managers in educational institutions on innovation in education with the mediating role of knowledge sharing has not been examined within the framework of structural equation modeling. Therefore, the fundamental issue of the present study is to investigate the impact of transformational leadership of managers in educational institutions on innovation in education with the mediating role of knowledge sharing, in order to enrich the literature and empirical experience in this area and take a step towards improving innovation in education.

Based on the theoretical literature and theoretical framework obtained from the research background, the conceptual model of the research is depicted in Figure 1. As can be seen, in this model, transformational leadership of managers in educational institutions is considered as the independent variable, knowledge sharing as the mediating variable, and innovation in education as the dependent variable. Therefore, the research hypotheses are as follows:

H1: Transformational leadership of managers in educational institutions affects knowledge sharing.

H2: Transformational leadership of managers in educational institutions affects innovation in education. H3: Knowledge sharing affects innovation in education.

H4: Knowledge sharing mediates the impact of transformational leadership of managers in educational institutions on innovation in education.

Research Methodology

Population and Sample

The target population for this research consisted of teachers and professors in educational institutions in Tehran. A total of 138 individuals participated in the study. Initially, 160 questionnaires were distributed among teachers and professors in educational institutions in Tehran. After excluding incomplete questionnaires (22 questionnaires), 138 questionnaires were included in the analysis.

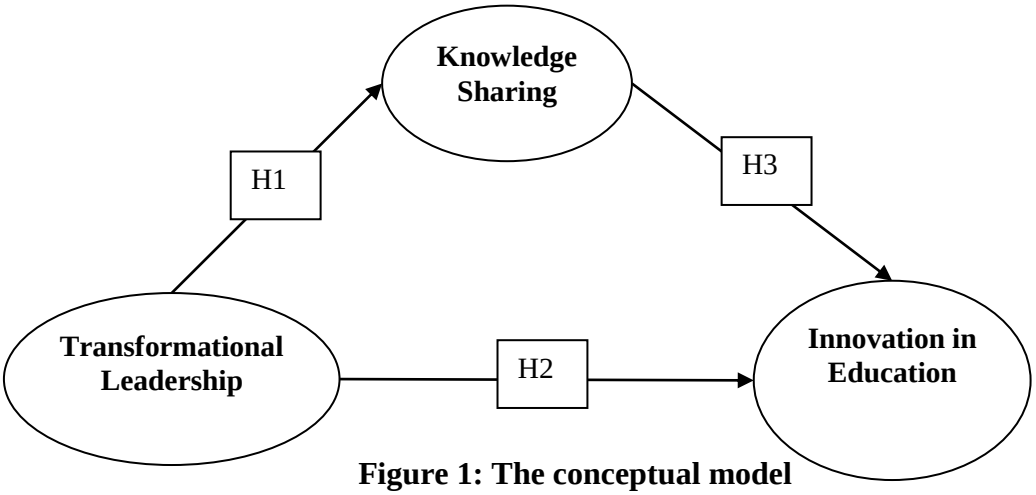

Figure 1: The conceptual model

Measures

To measure transformational leadership, the Bass & Avolio (2000) questionnaire is utilized. This questionnaire consists of 20 items and includes dimensions of intellectual stimulation (5 questions), inspirational motivation (4 questions), idealized influence (7 questions), and individual considerations (4 questions). For measuring knowledge sharing, the Al-Mulla et al. (2019) questionnaire with 6 items is employed. Additionally, for assessing innovation in education, the Jorfi & Branch (2013) questionnaire with slight modifications is used, comprising 10 items. The items were measured on a five-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

Reliability and Validity

The measurement model is tested for reliability and validity of constructs and research tools. Fornell and Larcker (1981) propose three criteria for assessing reliability: item reliability, composite reliability (CR), and average variance Extracted. Table 1 displays factor loadings, composite reliability, and AVE values, demonstrating the constructs' sufficient reliability.

To evaluate structural validity, Table 2 details item cross-loadings on research constructs. Table 2 shows that all dimensions have high factor loadings on their respective constructs with a factor loading difference exceeding 0.1, indicating sufficient validity. Table 3 presents results on correlations and the second validity criterion, the square root of Average Variance Extracted.

Structural Model

A conceptual model was analyzed for predicting innovation in education using SEM with PLS estimation (Kamranfar et al., 2023 ; Toosi and Ahmadi, 2023). Research hypotheses guided the analysis, and a Bootstrap method (500 subsamples) determined significance. Figure 2 depicts relationships among variables, showing positive and significant impacts of transformational leadership on knowledge sharing and innovation in education. Knowledge sharing also positively and significantly influences innovation, with circle numbers indicating explained variances.

Table 4 reports the estimation of path coefficients and explained variances of the research variables. Table 4 shows the significant impact of transformational leadership on knowledge sharing and innovation in education. It also highlights the mediating role of knowledge sharing in this relationship. The model explains 51% of educational innovation variance and 38% of knowledge sharing variance.

Conclusion

The aim of the present study was to propose a model for investigating the impact of transformational leadership of educational institution managers on innovation in education, with knowledge sharing as a mediating factor, using the structural equation modeling method.

The results indicated that the proposed model fits the data relatively well and can explain 51% of the variance in educational innovation and 38% of the variance in knowledge sharing.

Table 1: The results of Reliability

Variable	Item	Factor Loading	Cronbach's Alpha	composite reliability	AVE
Intellectual Stimulation	1	0.818	0.826	0.876	0.586
	2	0.808			
	3	0.768			
	4	0.724			
	5	0.707			
Idealized Influence	6	0.779	0.888	0.913	0.60
	7	0.79			
	8	0.818			
	9	0.841			
	10	0.768			
	11	0.729			
	12	0.687			
Inspiration Motivation	13	0.884	0.877	0.916	0.731
	14	0.847			
	15	0.857			
	16	0.831			
Individual Consideration	17	0.838	0.837	0.890	0.669
	18	0.792			
	19	0.781			
	20	0.857			
Knowledge Sharing	1	0.74	0.837	0.878	0.546
	2	0.759			
	3	0.713			
	4	0.683			
	5	0.755			
	6	0.777			
Innovation in Education	1	0.773	0.931	0.941	0.617
	2	0.816			
	3	0.792			
	4	0.767			
	5	0.79			
	6	0.812			
	7	0.818			
	8	0.831			
	9	0.763			
	10	0.683			

Table 2: Cross loading

	Innovation in education	Knowledge Sharing	Transformational Leadership
EN1	**0.773**	0.566	0.518
EN10	**0.683**	0.442	0.425
EN2	**0.816**	0.490	0.375
EN3	**0.792**	0.540	0.486
EN4	**0.767**	0.472	0.422
EN5	**0.790**	0.595	0.464
EN6	**0.812**	0.500	0.514
EN7	**0.818**	0.503	0.532

EN8	**0.831**	0.568	0.525
EN9	**0.763**	0.478	0.627
KS1	0.442	**0.740**	0.378
KS2	0.594	**0.759**	0.520
KS3	0.395	**0.713**	0.385
KS4	0.342	**0.683**	0.267
KS5	0.508	**0.755**	0.476
KS6	0.555	**0.777**	0.583
RT1	0.589	0.537	**0.818**
RT2	0.501	0.412	**0.807**
RT3	0.294	0.247	**0.768**
RT4	0.366	0.328	**0.724**
RT5	0.318	0.388	**0.707**
RT6	0.520	0.540	**0.779**
RT7	0.480	0.446	**0.790**
RT8	0.548	0.462	**0.818**
RT9	0.550	0.513	**0.841**
RT10	0.471	0.333	**0.768**
RT11	0.346	0.435	**0.729**
RT12	0.415	0.475	**0.687**
RT13	0.432	0.317	**0.884**
RT14	0.318	0.380	**0.847**
RT15	0.423	0.325	**0.857**
RT16	0.488	0.450	**0.831**
RT17	0.509	0.490	**0.838**
RT18	0.212	0.440	**0.792**
RT19	0.257	0.339	**0.781**
RT20	0.509	0.561	**0.857**

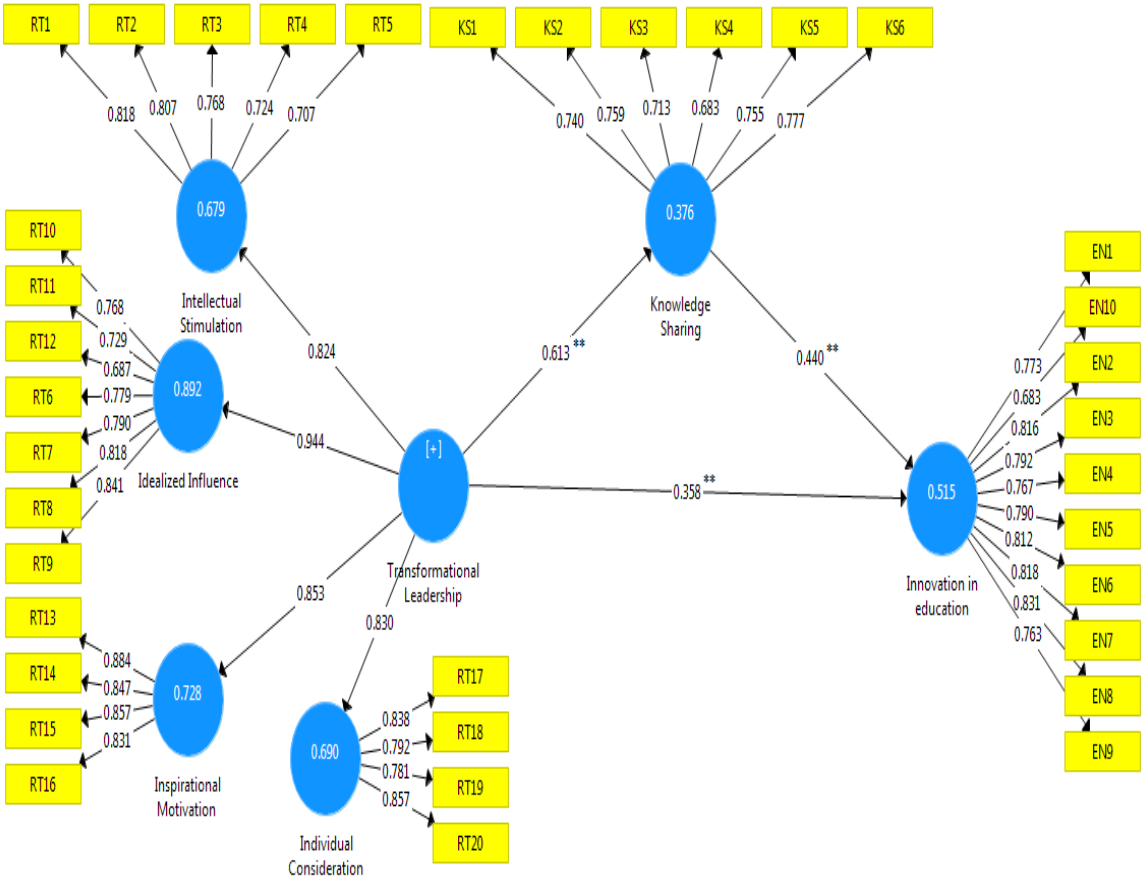

Figure 2: The PLS test

Table 3: The results of second validity criterion

Variable	Transformational Leadership	Knowledge Sharing	Innovation in Education
Transformational Leadership	0.86		
Knowledge Sharing	0.61**	0.74	
Innovation in Education	0.62**	0.65**	0.78

Table 4: Path coefficients and explained variances

Variables	Direct Effect	Indirect Effect	Explained Variance
To Innovation in Education Via:			
Knowledge Sharing	0.44**	-	0.515
Transformational Leadership	0.358**	0.269**	
To Knowledge Sharing via:			
Transformational Leadership	0.613**	-	0.376

The study revealed that transformational leadership positively impacts knowledge sharing by fostering optimism about the future, enthusiasm for tasks, and creating a compelling vision. Transformational leaders inspire commitment and drive organizational change, leading to improved performance and a culture of knowledge sharing (Tehranian et al., 2024). Their focus on values and beliefs cultivates trust and respect, further enhancing knowledge exchange among team members. The study shows that transformational leadership positively affects innovation in education by motivating and effectively communicating with subordinates, driving change, and supporting common values. By inspiring individual efforts and increasing awareness of organizational values, transformational leaders activate higher-level needs, ultimately boosting innovation capabilities. The study shows that sharing knowledge significantly boosts innovation in education. When educational institutions share knowledge, collaborate with similar companies, and engage in common idea sharing, it leads to increased innovation. This underscores the importance of knowledge as a tool for action and problem-solving, highlighting how sharing it leads to new insights and innovation. Effective knowledge sharing reduces costs, ensures best practices are disseminated, and fosters innovation within educational institutions. The study suggests that knowledge sharing is crucial in linking transformational leadership in educational institutions to innovation. Transformational leadership fosters innovation through knowledge sharing, highlighting the importance of adaptability and problem-solving skills. This leadership style supports long-term organizational changes and promotes growth, emphasizing ethical principles and a deep understanding of challenges. However, the study's generalizability is limited to teachers and professors in Tehran, and causal relationships cannot be inferred due to the correlational nature of the research. For future research, exploring the integration of mixed methods, qualitative analysis (Ghorashi et al., 2018), data mining, and machine learning techniques (Aghamohammadghasem et al., 2023; Owrang et al., 2025 ; Gholami et al., 2021; Gholami et al., 2022) could offer deeper insights into the complex relationships within transformational leadership and knowledge sharing dynamics compared to traditional linear techniques like SEM and multiple regression.

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