



How School Principal's Humility Encourages Teachers to Be More Innovative : The Role of Informal Learning and Psychological Safety as Mediators

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Abstract: This study aims to examine how principals' leader humility influences teachers' innovative work behavior through the mediating roles of psychological safety and informal learning. This study used a quantitative survey method. There were four instruments used, including Teacher Innovative Work Behavior Scale, Expressed Humility Scale, Individual Psychological Safety Scale, and Informal Learning Scale. Data were collected from 221 teachers in Indonesia using a convenience sampling technique. Hypotheses were tested using Model 6 of the Hayes PROCESS macro. All hypotheses were supported by the data, indicating that the effect of leader humility on innovative work behavior is mediated by psychological safety ($\beta = 0.06$; 95% CI = [0.03, 0.11]), informal learning ($\beta = 0.09$; 95% CI = [0.02, 0.15]), and serial mediation of psychological safety and informal learning ($\beta = 0.07$; 95% CI = [0.03, 0.12]). These findings highlight the importance of school principal training focused on humility, interpersonal risk management training for teachers, the establishment of teacher learning groups, and enhancement of school management support for teachers' innovation processes.

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Introduction

In today's fast-paced world, education may need to consider how to keep pace with the evolving needs of students (Gkontelos et al., 2023; Zainal & Matore, 2019). Teachers play the primary role in addressing these demands by engaging in behaviors that go beyond conventional practices (Janssen, 2000). These extraordinary behaviors are innovative work behaviors. Innovative work behavior (IWB) is defined as "a multi-stage iterative process in which employee behaviour targets the exploration of opportunities, idea generation, idea promotion, idea realization and the sustainable implementation of these ideas, processes, products or procedures within a role, a group or an organization, whereby the ideas are (relatively) new and intended to benefit the relevant unit of adoption" (Lambriex-Schmitz et al., 2020, p. 320). Teachers who exhibit IWB can enhance student engagement, critical thinking, and produce creative works or products (Huang, 2021; Thurlings et al., 2015), while also improving their own job performance (Deng et al., 2022) and job satisfaction (Aslan & Atesoglu, 2021).

Conservation of Resources (COR) theory explains how external and internal resources influence an individual's ability to engage in IWB. According to COR theory (Hobfoll et al., 2018), innovation is viewed as a stressor due to its inherent risks, uncertainties, and potential failures (Namono et al., 2021), making individuals reliant on material, personal, or social resources to engage in innovative work behavior (IWB). Resources are valuable entities,



whether material, personal, or social, derived from family, organizations, or the broader community, used to achieve goals and overcome challenges (Hobfoll et al., 2018).

The concept of resource caravan passageways explains that the environment, such as the school leader, plays a vital role in encouraging or hindering the formation of personal resources (Hobfoll et al., 2018). While top-down leadership stifles innovation by restricting autonomy (Coun et al., 2021), a bottom-up leadership approach—which prioritizes meaningful and quality relationships—is an essential resource for employees to collectively address challenges (Riantoputra, 2023), which stimulates novel ideas. A leadership approach that may be categorized as “bottom-up” is that of leadership marked by humility (Wang et al., 2018).

Leader humility is defined as “an interpersonal characteristic that emerges in a social context that connotes (a) a manifested willingness to view oneself accurately, (b) a displayed appreciation of others’ strengths and contributions, and (c) teachability” (Owens et al., 2013, p. 1518). Leader humility has demonstrated positive effects on innovative work behavior in corporate and healthcare settings (Ali et al., 2020; Yang et al., 2019), yet it needs to be explored in educational settings. In fact, in this era, school principals must prioritize learning over administration (Suryati, 2023). Leading a school is equivalent to leading learning. School principals who are willing to learn and teach embody humility. Humble leaders who embrace failure, value feedback, and celebrate small successes create particularly valuable resources during high-pressure innovation periods, aligning with COR theory's gain paradox principle (Hobfoll et al., 2018). This leadership approach stands in stark contrast to current realities where only 20% of school principals actively focus on improving teaching and learning quality (Dzulfikar, 2020), highlighting both the need and opportunity for humility-driven leadership in schools.

While Ali et al. (2020) reported a small direct effect of leader humility on IWB ($\beta = 0.19, p < 0.01$), Yang et al. (2019) found a stronger indirect effect through work engagement ($\beta = 0.25, p < 0.01$). The fact that indirect effects are stronger with the presence of personal resources forms the basis for this study to use personal resources as mediators that can strengthen the relationship between leader humility and IWB, as well as explain the mechanisms of their relationship in greater detail. Personal resources facilitate individual abilities to cope with the pressure to innovate (Hobfoll et al., 2018).

Psychological resources that emerge from leader humility and can drive IWB is psychological safety (Elsayed et al., 2023; Gonçalves & Brandão, 2017). In the context of teachers, psychological safety is a potential variable that warrants investigation about IWB. Newman et al. (2017) reported the concept of psychological safety has been demonstrated to be applicable at both the individual level and team level. At the individual level, psychological safety is defined by Carmeli et al. (2010, p. 252) as “individuals’ perceptions of the consequences of taking interpersonal risks in their work environment.” Psychological safety at the individual level is more appropriate in the context of teachers, as they tend to work independently in classrooms.

Humble school principals are a valuable resource in developing psychological safety (Gonçalves & Brandão, 2017), enabling teachers to express authentic ideas and take interpersonal risks without fear of rejection or other negative consequences that could harm their self-image or career (Kahn, 1990). Then, this perception of feeling safe is a crucial resource for IWB. IWB involves taking interpersonal risks, including discussions about potential improvements in work methods with colleagues, suggesting new ideas to peers, proposing ideas to leaders, seeking support and assistance in realizing ideas, and discussing the development of already implemented ideas (Lambriex-Schmitz et al., 2020). Teachers



believe that their colleagues and leaders will not undermine their efforts to innovate. As posited by COR theory, psychological safety not only mitigates innovation-related anxiety (Elsayed et al., 2023), but also initiates resource gain spirals, where successful innovations yield additional resources, such as recognition, rewards, or positive performance evaluations (Hobfoll et al., 2018), thereby reinforcing teachers' continued innovative efforts.

Another personal resource essential for demonstrating IWB is knowledge, which is acquired through learning. Humble leaders can inspire informal learning through interaction and reflection (Rigolizzo et al., 2022). The humility of school principals empowers teachers to engage in informal learning, perceiving every interaction with others as an opportunity for learning and recognizing every challenge as an occasion for self-reflection. Informal learning is defined as "an activity taking place in five ways, comprising four types of interaction (learning through media, colleague interaction, stakeholder interaction, and student interaction) and individual reflection" (Huang et al., 2020, p. 3). Evidence indicates that up to 90% of actual learning occurs outside formal training settings, such as in teachers' daily work environments or outside of formal classes (Welk et al., 2023). Huang (2021) found that learning through interactions with students significantly impacts the generation of novel concepts for both teachers and students. Interacting with individuals who will experience the outcomes of innovation is a key driver of innovation (Kanter, 1988). Such interactions expose teachers to real-world situations, thereby increasing the likelihood of innovation arising from students' actual needs that may not surface in the context of formal learning.

Informal learning is not only driven by leader humility, but it is also influenced by the presence of psychological safety. Psychological safety energizes teachers' informal learning through resource investment (Hobfoll et al., 2018). When teachers feel safe, they actively invest this resource into learning interactions, exchanging knowledge, proposing opposing viewpoints, and challenging assumptions without fear (Edmondson, 1999; Liu et al., 2014). Teachers will acquire additional resources, such as enhanced knowledge and constructive feedback, suggestions, and critiques. The acquisition of knowledge can in turn enable the identification of problems and the generation of solutions. Since new ideas often emerge through interaction and discussion, the likelihood of stakeholders supporting the realization of these ideas becomes higher. This support reflects the strengthening of the resource caravan (Hobfoll et al., 2018). Therefore, the resources gained from informal learning enable teachers to generate new ideas and obtain the necessary support to implement them.

Based on the literature review on the antecedents of IWB, this study aims to examine the effect of leader humility on innovative work behavior, mediated by psychological safety and informal learning, guided by COR theory. By integrating these variables, the research aims to explain the comprehensive mechanisms underlying IWB in educational settings. The findings are expected to contribute to the development of literature of teacher's innovative work behavior and the application of COR theory in education. In terms of practical contributions, this study's findings are expected to enhance teachers' awareness of psychological safety and informal learning for innovation, guide school principals in developing humility, and inform school/government programs to boost innovative work behavior in education.

Research Method

This study employed a quantitative correlational design with a cross-sectional approach to examine the relationships between variables without manipulating the independent variables. Data were collected at a single point in time from a population of Indonesian teachers with at least one year of teaching experience and who are not currently



serving as school principals. School principals were excluded from the study since humility needs to be assessed by others (Owens et al., 2013).

The target sample size for this study was 119 teachers, based on calculations generated by G*Power software (Faul et al., 2009). Data collection employed a convenience sampling technique. Participants were recruited from online communities on Twitter and Facebook. A total of 221 teachers participated in the study, exceeding the minimum required sample size. The age range of the participants was from 21 to 58 years, with an average age of 30 years. The majority of the participants were female (72.8%). The range of job tenure among participants was 1-36 years, with an average of 6 years. The majority of participants (80.1%) had obtained an undergraduate degree, with a significant proportion of these individuals having graduated from education majors (83.3%). The majority of participants were contract/honorary teachers (67.9%), had salaries below the minimum wage (58.8%), taught in kindergartens/RAs/equivalents (43.9%), were located in rural areas (55.7%), and worked in public schools (57.0%).

This study employed four instruments to measure key variables. Innovative work behavior (IWB) was assessed using a 15-item scale adapted from Lambriex-Schmitz et al. (2020), rated on a four-point Likert scale ($\alpha = 0.92$). Leader humility was measured using the 9-item Expressed Humility Scale by Owens et al. (2013), rated on a six-point Likert scale ($\alpha = 0.89$). Psychological safety was assessed with a 5-item individual-level psychological safety scale by Carmeli et al. (2010), rated on a five-point Likert scale ($\alpha = 0.73$). Lastly, informal learning was measured using an 18-item scale by Huang et al. (2020), rated on a five-point Likert scale ($\alpha = 0.89$).

In addition to the four primary variables, this study incorporates demographic variables. Several demographic variables are predicted to influence the results of this study and thus need to be controlled, including age, level of education, teaching experience or years of teaching, income, and type of school. These variables have been shown to significantly affect IWB (Etikariena, 2019; Fidan & Oztürk, 2015; Hussain et al., 2020; Thurlings et al., 2015; Zainal & Matore, 2019).

To ensure data quality, common method bias was assessed using Harman's single factor test, while hypothesis testing was conducted using Model 6 of the PROCESS macro by Hayes (2013) in SPSS. The indirect effects were tested using 5000 bootstrap samples with a 95% confidence interval. The expected confidence interval values should not cross zero (Hayes, 2013). Since Bootstrap was employed, the assumption of normality does not need to be met (Preacher & Hayes, 2008). Furthermore, it is important to account for covariates in the model to control for the effects of the control variables.

Results and Discussion

Common Method Bias

Harman's single-factor test in this study yielded a variance of 28.81%. When the variance is less than 50%, it indicates that the data is not dominated by a single source of variance (Rodríguez-Ardura et al., 2020). In other words, no single method dominates the results of this study. This suggests that there is no significant potential for bias arising from the use of the same research method.

Descriptive Analysis

The correlation test results in Table 1 show that none of the control variables is correlated with innovative work behavior (IWB). However, these demographic variables were still controlled for in hypothesis testing, as previous studies have found that these variables can influence the variability of innovative work behavior (Thurlings et al., 2015;



Zainal & Matore, 2019). Additionally, all core variables in this study, such as IWB, leader humility (LH), psychological safety (PS), and informal learning (IL), are correlated with each other.

Table 1. Descriptive Analysis

	Mean	SD	1	2	3	4
IWB	3.06	0.48	1			
LH	4.86	0.68	0.40*	1		
PS	4.54	0.76	0.52*	0.44*	1	
IL	3.17	0.39	0.79*	0.33*	0.42*	1

Note. N = 221. IWB = Innovative work behavior; LH = Leader humility; PS = Psychological safety; IL = Informal learning; (2-tailed). * $p < 0.05$

Hypothesis Testing

Table 2. Direct Effect

	Psychological Safety		Informal Learning		Innovative Work Behavior	
	β	SE	β	SE	β	SE
Independent Variable						
LH	0.50*	0.07	0.11*	0.04	0.06*	0.03
PS	-	-	0.17*	0.35	0.13*	0.03
IL	-	-	-	-	0.83*	0.05
Control Variable						
US	0.00	0.01	-0.01	0.01	0.00	0.00
JK	-0.21	0.11	-0.00	0.06	-0.05	0.04
TP	0.00	0.08	0.00	0.04	-0.07*	0.03
MK	-0.00	0.00	0.01	0.00	0.00	0.00
PD	0.02	0.06	-0.05	0.03	-0.05	0.03
JS	-0.23	1.00	-0.11	0.05	0.01	0.04
<i>R</i>	0.47		0.49		0.83	
<i>R</i> ²	0.22		0.24		0.70	
<i>F</i>	8.81		8.58		54.51	
<i>df</i> ₁	7		8		9	
<i>df</i> ₂	213		212		211	
<i>p</i>	0.00		0.00		0.00	

Note. Gender is coded as 0 = Female, 1 = Male. Education level is coded as 0 = High School, 1 = Diploma, 2 = Undergraduate, 3 = Postgraduate. Income is coded as 0 = Below regional minimum wage (UMR), 1 = Equal to UMR, 2 = Above UMR. School type is coded as 0 = Public, 1 = Private. US = Age; JK = Gender; TP =

*Education level; MK = Work tenure; PD = Income; JS = School type; IWB = Innovative work behavior; LH = Leader humility; PS = Psychological safety; IL = Informal learning; (1-tailed). *p < 0.05*

The results of the serial mediation analysis (Model 6) in Table 2 support all of the research hypotheses. This model is significant with an R² coefficient of 0.70 (p < 0.05). This indicates that 70% of the variance in innovative work behavior can be predicted by leader humility, psychological safety, and informal learning. The remaining 30% is predicted by other variables outside the scope of this study. Both the direct and indirect effects through the mediator variables on the dependent variable are significant. The illustration of the research model is shown in Figure 1.

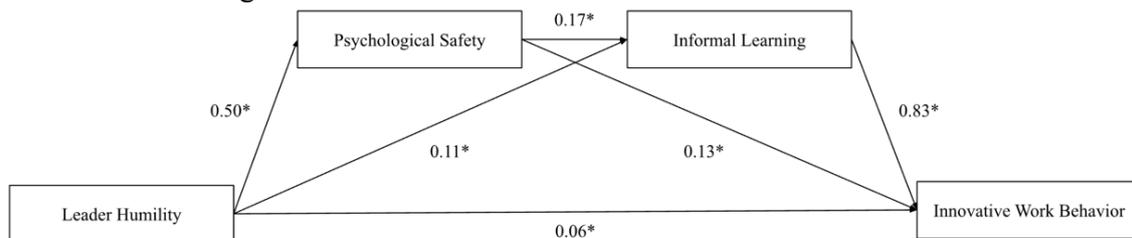


Figure 1. Serial Mediation Model

Leader humility significantly and positively affects innovative work behavior ($\beta = 0.06$; $p < 0.05$). However, the small effect size suggests the need for a clearer mechanism through which LH influences IWB. Therefore, LH should be mediated by variables that strengthen its relationship with IWB.

Table 3. Indirect Effect

	Effect	BootSE	BootLLCI	BootULCI	Hypothesis
LH → PS → IWB	0.06	0.02	0.03	0.11	H1 is supported
LH → IL → IWB	0.09	0.03	0.02	0.15	H2 is supported
LH → PS → IL → IWB	0.07	0.02	0.03	0.12	H3 is supported

Note. N = 221. IWB = Innovative work behavior; LH = Leader humility; PS = Psychological safety; IL = Informal learning.

The mediator variables in this study are psychological safety and informal learning. All mediations are partial, as the direct effect of LH on IWB is significant. Based on Table 3, the first hypothesis (H1) is supported by the data with $\beta = 0.06$; 95% CI = [0.03; 0.11]. This indicates that psychological safety mediates the effect of leader humility on innovative work behavior. The second hypothesis (H2) is also supported by the data with $\beta = 0.09$; 95% CI = [0.02; 0.15]. This indicates that informal learning mediates the effect of leader humility on innovative work behavior. Finally, the third hypothesis (H3) is also supported by the data with $\beta = 0.07$; 95% CI = [0.03; 0.12]. This suggests that psychological safety and informal learning sequentially mediate the effect of leader humility on innovative work behavior.

Discussion

All hypotheses in this study are supported by the data. The results indicate the existence of three mediation pathways from leader humility to IWB: 1) through psychological safety, 2) through informal learning, and 3) through psychological safety and informal learning in sequence. Hypothesis 1 (H1) confirms that the effect of leader humility on IWB is mediated by psychological safety ($\beta = 0.06$; 95% CI = [0.03; 0.11]). The findings of this study are consistent with the previous research, showing humble leaders foster environments where teachers feel safe taking interpersonal risks essential for innovation (Elsayed et al., 2023; Gonçalves & Brandão, 2017). This mechanism through psychological safety is



particularly crucial in educational settings where IWB require idea-sharing and extensive collaboration to support the ide implementation and sustainability (Lambriex-Schmitz et al., 2020).

The mediating role of psychological safety demonstrates that teachers in Indonesia greatly require a sense of psychological safety in taking interpersonal risks. Meanwhile, a cultural condition inherent in Indonesian society is high power distance (The Culture Factor, 2024), which has been shown to weaken an individual's sense of psychological safety (Appelbaum et al., 2020). Based on interviews with teachers in Bukittinggi and Yogyakarta, similar interpersonal issues were found, where junior teachers tended to fear interacting with senior teachers (Amelia & Suryadi, 2015; Syahril & Friesyyah, 2021). The imbalance of power is reflected in the behavior of senior teachers, who perceive themselves as having a higher status and control than junior teachers. This perception leads senior teachers to believe their opinions are absolutely correct, resulting in the rejection of opinions held by junior teachers and even the blame being placed on them. Such power dynamics can suppress individual participation and undermine collaborative efforts within teams (Appelbaum et al., 2020). The findings of this study reinforce these two findings, particularly as the average age of the teachers in the sample was 30 years. This age is still considered relatively young, falling within the trial phase of career development (Duarte & Lopes, 2018). These facts indicate that teachers, especially those at the beginning of their careers, require humble leaders and psychological safety to foster innovative work behavior.

Hypothesis 2 (H2) also confirms that the effect of leader humility on IWB is mediated by informal learning ($\beta = 0.09$; 95% CI = [0.02; 0.15]). The results of this study align with the previous research, showing humble leaders demonstrate how to be involved in learning during everyday interactions (Rigolizzo et al., 2022). Additionally, the results of this study are consistent with the findings of Lecat et al. (2018), who compared the effects of formal and informal learning on teachers' IWB. Lecat et al. (2018) found that informal learning can promote IWB, while formal learning has no contribution to IWB. This study confirms that the impact of informal learning on IWB is indeed substantial ($\beta = 0.83$). This finding can be explained by the fact that informal learning is driven by personal initiative, whereas formal learning is typically assigned by the organization (Lecat et al., 2018). Furthermore, informal learning can be done continuously, unlike formal learning, which requires scheduling and is therefore less frequent (Marsick & Volpe, 1999). Thus, informal learning through interaction and self-reflection plays a crucial role in discussing issues, promoting new solutions, and finding ways to implement them. The ideas that emerge through these discussions have undergone careful consideration and mutual agreement, making the new ideas more readily accepted.

Hypothesis 3 (H3) also confirms that the effect of leader humility on innovative work behavior is mediated by both psychological safety and informal learning ($\beta = 0.07$; 95% CI = [0.03; 0.12]). This finding suggests that psychological safety and informal learning sequentially mediate the effect of leader humility on innovative work behavior. The serial mediation effect in this study implies that the variation in informal learning is not solely explained by leader humility but is also explained by psychological safety. These findings align with the research of Liu et al. (2014), which showed that learning through personal reflection or interactions with colleagues can be triggered by psychological safety. Additionally, Cauwelier et al. (2016) found that teams with high psychological safety were more engaged in collective learning than teams with low psychological safety. This comparison was obtained through an experiment with nine teams consisting of eight members each. Since psychological safety reduces the fear of interpersonal risks (Edmondson, 1999),



this ability can encourage individuals to approach relevant people with learning goals in mind and ask questions without fear of being judged as foolish or incompetent (Cauwelier et al., 2016). Individuals who feel psychologically safe are not bothered with protecting their self-image (Kahn, 1990), but instead prioritize personal growth. They are also more willing to share knowledge and opinions without the fear of being criticized. This process enriches their skills and insights, which, in turn, enhances their ability to innovate.

Informal learning plays a stronger mediating role than both psychological safety and the serial mediation pathway itself. Drawing on Conservation of Resources (COR) theory (Hobfoll et al., 2018), informal learning supplies cognitive resources in the form of knowledge and skills that help teachers formulate and sustain the implementation of new ideas. In contrast, psychological safety offers emotional resources that reduce anxiety and foster the confidence needed to take interpersonal risks during the innovation process (Elsayed et al., 2023). Interestingly, the results reveal that when informal learning and psychological safety are examined together, the total mediating effect decreases, suggesting that the role of psychological safety is largely overshadowed by informal learning. These findings highlight that in the educational context, informal learning practices—such as peer interactions within the school community and self-reflection—are more critical in translating a principal's humility into teachers' innovative work behavior than psychological safety alone. Therefore, informal learning serves as the primary mechanism linking leader humility to IWB, while psychological safety functions as a supporting resource. Without informal learning, teachers may lack the necessary skills and knowledge to engage in innovative work behaviors within their teaching practices.

This study makes a theoretical contribution by extending the application of Conservation of Resources (COR) theory in the context of teachers' innovative work behavior. Leader humility initiates resource gain spirals—psychological safety provides emotional resources to mitigate innovation risks, while informal learning supplies cognitive resources through knowledge acquisition. Given the key role of leader humility in shaping these mechanisms, this study also strengthens the literature on bottom-up leadership. From a practical standpoint, teachers are encouraged to actively seek informal learning through interactions with fellow teachers, students, their parents, and learning communities. Moreover, school principals are urged to practice humility in order to create a sense of psychological safety among teachers and to facilitate discussions with teachers.

Conclusion

This study identifies the mechanisms through which leader humility influences innovative work behavior among teachers in Indonesia. Leader humility can affect innovative work behavior both directly and indirectly. Psychological safety and informal learning mediate the impact of leader humility on innovative work behavior. The findings highlight that psychological safety and informal learning serve as crucial mechanisms in enhancing the influence of leader humility on innovative work behavior.

Recommendation

Based on the findings of this study, three key recommendations can be drawn for stakeholders to enhance teachers' innovative work behavior. First, teachers should actively cultivate informal learning opportunities through frequent dialogues with the school community and self-reflection. For concrete instance, teachers routinely seek student feedback at the end of lessons and hold regular meetings with parents to understand their aspirations and enhance collaboration. Establishing discussion groups between senior and



junior teachers could particularly help create more equitable working relationships and knowledge exchange. Group discussions are not only useful for increasing knowledge, but also for breaking down the ‘walls’ that limit teachers to make them feel psychologically safer. Thus, when the group discussion process is conducted, it is essential to foster an environment that values diversity of thought, embraces the potential for errors, and encourages mutual vulnerability among teachers. Second, school principals should exhibit humility by acknowledging their limitations in skills and knowledge, admitting personal mistakes, inspiring others to learn from these mistakes, embracing failure, being willing to learn from the teachers they lead, listening to teachers’ ideas, opinions, and feedback, valuing diverse perspectives, recognizing their contributions, and appreciating their efforts for the advancement of students and the school. Third, policymakers and school management should prioritize leadership training emphasizing the importance of humility. Training programs could include work situation simulations, such as managing conflicts among team members, where leaders are encouraged to listen to perspectives fairly. The training also needs to focus on interpersonal risk management to create psychological safety among teachers and a mentoring program for teachers to support continuous learning.

In addition to practical recommendations, two important suggestions for future research may be considered. First, this study lacks an in-depth exploration of contextual factors, such as administrative burdens and school facilities. Excessive administrative workload drains teachers’ time and energy, leaving limited resources for engaging in innovative work behaviors. These unexamined contextual factors could be considered moderator variables in future studies since the model used in this present research did not incorporate moderator variables. Additionally, this study focused solely on one leadership style, namely leader humility. Future research could compare leader humility with opposing leadership styles, such as abusive supervision (Liu et al., 2023), to explore the differences in their impact on IWB. Further studies are also encouraged to examine other leadership styles or explore additional internal and external factors influencing innovative work behavior. For instance, external factors such as the role of parents may be potential for further investigation, as in this study, the involvement of parents was limited to formal learning. Material and non-material support from parents is crucial for teachers to successfully implement new ideas that benefit students. These investigations would help develop a more nuanced understanding of how to foster innovation in diverse school environments.

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