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Transformational Leadership, Teacher Well-Being and Innovative Work Behavior: Mediation in the National School Context

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ABSTRACT

Twenty-first-century learning requires teachers to innovate, which in turn depends on agile school leadership and a supportive work environment. National indicators show that only 43.23% of teachers display a high level of innovative work behavior (IWB), even though transformational leadership (TL) practices are widely implemented. This gap raises the question of how leadership is translated into innovation. This study examined teacher well-being as a mediator between TL and IWB in national primary schools. Using a quantitative cross-sectional design, data were collected from 351 randomly selected teachers in 23 schools in the Barat Daya District of Penang. Adapted scales measured TL, teacher well-being and IWB, with high overall reliability ($\alpha \approx .97$). Mediation analysis with the PROCESS macro (Model 4) showed a significant indirect effect of TL on IWB through well-being ($B = 0.18$, $SE = 0.08$, $p < .001$, 95% CI [0.04, 0.28]). Among the TL dimensions, high performance expectations and intellectual stimulation had the largest indirect effects. These findings are consistent with the Job Demands–Resources and Broaden-and-Build theories, which hold that positive work environments support teacher engagement and innovation. The results suggest that teacher well-being is one psychosocial mechanism through which leadership is translated into innovative practice. School leaders are advised to prioritize well-being-focused strategies, such as building psychological safety, reducing administrative burdens and recognizing teacher effort, to strengthen innovation in schools. The study contributes to leadership theory in education and offers practical guidance for leadership development.

1. Introduction

Globalization and digitalization require schools to develop teachers who are agile, creative and innovative in their teaching. The OECD [28] treats innovation as a core capability of public institutions, and teachers' innovative behavior has been linked to students' intrinsic goal orientation [25]. Teachers' innovative work behavior (IWB), defined as the process of generating, promoting and realizing new ideas [17], has therefore become an essential requirement in schools.

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School leadership shapes this culture of innovation. The MOE Strategic Plan 2024–2030 [27] calls for stronger school leadership competencies to improve human resource management and educational quality. Empirical studies show that transformational leadership increases teachers' commitment and innovative practices, especially when teachers trust the principal [19], and that leadership practices which support professional collaboration are associated with organizational innovativeness [10].

Teacher well-being is also increasingly recognized as a core component of school effectiveness. The Teacher Wellbeing Index 2023 reported that 78% of education staff in the United Kingdom experienced work-related stress, rising to 89% among senior leaders [13]. Locally, workload has been identified as one of the main factors affecting teachers' psychological well-being [3], and workload is one of the work-environment factors linked to the performance of Malaysian teachers [23]. A positive and inclusive work environment is associated with stronger organizational commitment and performance. Well-being may therefore be an important mechanism linking leadership to IWB.

Despite these initiatives, the Malaysia Education Blueprint (PPPM) Annual Report 2022 shows that only 43.23% of teachers reach a high level of IWB in teaching and learning (PdP) [26], which leaves considerable room for improvement. In line with the MOE Strategic Plan 2024–2030, this study examines how transformational leadership practices influence IWB through teacher well-being. Initial evidence for a mediating role of well-being comes from research on instructional leadership [12]. The objective of this article is to determine whether well-being mediates the relationship between transformational leadership and IWB among national school teachers.

2. Problem Statements

Innovation in PdP is a national priority, but current indicators show that teachers' IWB has not yet reached an excellent level. The PPPM Annual Report 2022 recorded that, in Penang, only 43.23% of teachers were at a high IWB level, while 56.77% remained at a satisfactory level [26]. Masyany Musa and Hazri Jamil [24] noted that the 2020 Inspectorate report rated the overall quality of PdP as moderate (78.91%) and found that conventional teaching practices still dominated. These figures point to a gap between policy aspirations and classroom practice, and the mechanisms that drive teacher innovation need explanation. Previous studies in Malaysia have mostly examined the direct relationship between transformational leadership and IWB [36], or have tested other mediators such as teacher commitment [16], school organizational climate [35] and self-efficacy [4], without testing well-being as a mediating variable. Findings are also inconsistent. Transformational leadership significantly influenced teachers' IWB in some studies [36] but had no direct effect in others [1], and reported IWB levels range from moderately high [16] to high [35]. This raises the question of how and why leadership is translated into innovative behavior. A test of well-being as a mediator could help explain this chain of influence.

Empirical evidence on well-being as a mediator also varies by context. In Malaysian Islamic schools, teacher well-being partially mediated the effect of principal leadership style on teacher commitment [2], and a similar partial mediation has been reported between principals' authentic leadership and teachers' organizational commitment in China [33]. For innovation outcomes, teachers' workplace well-being mediated the effect of principal visionary leadership on instructional innovation [34]. In Malaysian secondary schools, however, Chen [9] found that only some dimensions of workplace well-being acted as mediators of principals' transformational leadership, and only a few transformational leadership dimensions influenced well-being and innovative behavior. Lu et al. [22] further showed that the indirect pathway from well-being to IWB was not significant when principals'

authentic leadership was low. This inconsistency calls for research that specifies the conditions under which well-being functions as a mediating mechanism.

In practice, a positive work environment that includes administrative support, collaboration and respect is associated with higher teacher motivation, commitment and performance. This makes well-being a plausible link between transformational leadership and IWB. However, local evidence at the national primary school (Sekolah Kebangsaan, SK) level is limited, particularly in districts with both urban and rural schools. This study therefore focuses on SK teachers in the Barat Daya District of Penang, where schools share the MOE's uniform administrative structure. It examines the mediating role of well-being in the transformational leadership → IWB relationship, in order to clarify the psychosocial mechanism linking leadership with teacher innovation and to inform well-being-based interventions in schools.

3. Literature Review

Transformational leadership in education is rooted in the work of Burns [8] and was refined by Bass [7] into four core dimensions: charismatic influence, inspirational motivation, intellectual stimulation and individual consideration. Leithwood and Jantzi [21] adapted this framework to schools, specifying six dimensions of school leader practice: identifying and communicating a vision, building acceptance of group goals, providing individual support, offering intellectual stimulation, modeling professional practices and values, and holding high performance expectations. In schools, these practices aim to change organizational culture, values and practices so that teachers and students can reach their full potential, which in turn supports pedagogical innovation.

Innovative work behavior (IWB) is the process by which individuals generate, promote and realize new ideas that benefit their task and organization. Janssen [17] treats IWB as a three-stage construct, and in schools it serves as a proxy for micro-innovation in the classroom. In national schools, teachers' IWB is the main channel through which transformational leadership aspirations become changes in PdP practice, such as authentic task design, technology integration or local curriculum adaptation.
Teacher well-being goes beyond the absence of stress. It includes positive emotional experiences, healthy mental functioning, supportive social relationships and good physical health. Van Horn et al. [31] describe five interrelated dimensions of occupational well-being (affective, cognitive, professional, social and psychosomatic) that influence work effectiveness. The Teacher Subjective Well-being Questionnaire (TSWQ) [29] operationalizes teacher well-being through teaching efficacy and school connectedness. The social dimension includes support from colleagues and administrators, which helps stabilize emotions, gives teachers a sense of being valued and sustains their motivation.

Several complementary theories explain the transformational leadership → well-being → IWB relationship. The Job Demands–Resources (JD-R) model holds that job resources such as leadership support, autonomy and a clear vision enhance engagement and well-being, which in turn improve work outcomes, including innovation [5]. Transformational leadership can thus be seen as a job resource that enhances well-being and, through it, innovation. The Broaden-and-Build theory [14] proposes that positive emotions broaden cognitive scope and build creative resources. Teachers with high well-being are therefore more open to new ideas, more willing to take measured risks and more likely to try innovative teaching approaches, whereas stress narrows focus and favors safe strategies. The PERMA framework [30] adds that positive emotion, engagement, relationships, meaning and accomplishment form the foundations of well-being that support performance and innovation.

Empirical evidence supports this theoretical link. Principals' transformational leadership significantly predicts teachers' well-being [18], and teacher well-being positively predicts IWB [22].

Well-being has also been found to mediate the effects of leadership on work outcomes such as organizational commitment [2, 33], creativity [32] and instructional innovation [34]. In addition, principals' transformational leadership has been shown to predict teacher well-being, which in turn predicts teacher performance [11]. Related studies show that transformational leadership influences teachers' innovative behavior through their sense of meaning at work [6] and through a supportive school organizational climate [35].

4. Methodology

This study used a quantitative cross-sectional survey design to measure transformational leadership (independent variable), teacher well-being (mediator) and IWB (dependent variable) in a single data collection period. This design suits the estimation of relationships among several constructs at once and reduces data collection cost and time.

The study was conducted among teachers in national schools (SK) in the Barat Daya District, Penang. Because all SKs share the same administrative structure under the Ministry of Education Malaysia, the instruments and the interpretation of findings could be standardized, and the district offered a mix of urban and rural schools. The population comprised 1,168 teachers in 23 SKs.

Teachers were selected by simple random sampling. All 23 schools were included as location clusters, and teachers were drawn by lot from a list obtained from each school. To increase the precision of the estimates, 30% of the teachers in each school were targeted, giving an actual sample of 351. According to Krejcie and Morgan [20], the minimum adequate sample for a population of 1,168 is about 289, so the sample of 351 exceeds this requirement.

The questionnaire had four parts: (A) demographics, (B) transformational leadership, (C) IWB and (D) teacher well-being. The transformational leadership scale was adapted from Leithwood and Jantzi [21] and comprised 24 items across six dimensions (vision, acceptance of group goals, individual support, intellectual stimulation, professional practices and values, and high performance expectations). IWB was measured with nine items from Janssen [17] covering idea generation, idea promotion and idea realization. Teacher well-being was measured with the eight-item Teacher Subjective Well-being Questionnaire (TSWQ) by Renshaw et al. [29]. Sections B to D used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Validity and reliability were established in several steps. For face validity, all items were translated from English into Malay and reviewed by two language experts for clarity and appropriateness. For content validity, three experts (from the Institute of Teacher Education [IPG], the Institute of Aminuddin Baki [IAB] and a SISC+ officer at the District Education Office) rated item relevance using the Content Validity Index (CVI); all items obtained an I-CVI of 1.00. A pilot study was then conducted with 34 SK teachers outside Penang whose characteristics matched those of the study sample. Cronbach's alpha showed very high overall reliability ($\alpha \approx .97$), with $\alpha \approx .94$ for the IWB subscale and $\alpha \approx .91$ for the well-being subscale.

Formal permission was obtained from the Educational Planning and Research Division (EPRD) of the Ministry of Education and the Penang State Education Department (JPN). The researcher contacted each school to explain the purpose of the study and obtain consent, after which the school distributed the questionnaire link to its teachers. Respondents had two weeks to complete the questionnaire online through Google Forms, which allowed them to respond at a convenient time and place.

5. Data Analysis

Mediation was tested with the PROCESS macro (Model 4) in SPSS, using 5,000 bootstrap samples to estimate the confidence interval (CI) of the indirect effect [15]. An indirect effect was considered significant when the 95% CI did not include zero. This procedure tested whether well-being mediated the relationship between TL (X) and IWB (Y).

Overall mediation model. Well-being significantly mediated the TL → IWB relationship. The indirect effect of TL on IWB through well-being was B = 0.18, SE = 0.08, $p < .001$, 95% CI [0.04, 0.28]. The component paths were also significant: TL → well-being ($R^2 = 0.85$, B = 1.03, $p < .001$) and well-being → IWB ($R^2 = 0.81$, B = 0.94, $p < .001$). As TL practice increases, teacher well-being increases, and this increase in well-being carries part of the effect of TL to IWB.

Mediation by TL dimension. When TL was decomposed into its six dimensions, every dimension showed a significant indirect effect through well-being ($p < .001$ for each path), with no 95% CI crossing zero. The largest indirect effects were for high performance expectations (B = 0.60, 95% CI [0.51, 0.69]) and intellectual stimulation (B = 0.58, 95% CI [0.46, 0.71]), followed by vision (B = 0.48, 95% CI [0.33, 0.63]), individual support (B = 0.47, 95% CI [0.36, 0.59]), professional practices and values (B = 0.47, 95% CI [0.37, 0.57]) and acceptance of group goals (B = 0.43, 95% CI [0.30, 0.57]). Clear performance expectations and intellectual challenge from leaders thus appear to be the dimensions most strongly linked to teacher innovation through well-being.

Type of mediation. Table 1 shows three mediation patterns. For overall TL, vision, acceptance of group goals and intellectual stimulation, both the direct and the indirect effects were significant and in the same direction, indicating complementary (partial) mediation (VAF = 41.86%–74.14%). For individual support and high performance expectations, the indirect effects were significant (B = 0.47 and B = 0.60) but the direct effects were not (c′ = .10 and c′ = .08), indicating indirect-only (full) mediation: the effect of these dimensions on IWB operated almost entirely through well-being (VAF = 82.46% and 88.24%). For professional practices and values, a positive indirect effect (B = 0.47) occurred alongside a small negative direct effect (c′ = −.12), indicating competitive mediation.

Table 1
Direct, Indirect, and Total Effects of Transformational Leadership on Innovative Work Behaviour Through Well-Being

Path	Direct effect (c′)	Indirect effect (ab)	SE	95% CI [LL, UL]	Total effect (c)	VAF (%)	Mediation type
TL (overall) → WB → IWB	.25*	.18*	.08	[.04, .28]	.43	41.86	Complementary
Vision → WB → IWB	.20*	.48*	.08	[.33, .63]	.68	70.59	Complementary
Group goals → WB → IWB	.15*	.43*	.07	[.30, .57]	.58	74.14	Complementary
Individual support → WB → IWB	.10	.47*	.06	[.36, .59]	.57	82.46	Indirect-only
Intellectual stimulation → WB → IWB	.22*	.58*	.06	[.46, .71]	.80	72.50	Complementary
Professional practices and values → WB → IWB	−.12*	.47*	.05	[.37, .57]	.35	—	Competitive
High performance expectations → WB → IWB	.08	.60*	.05	[.51, .69]	.68	88.24	Indirect-only

Note. TL = transformational leadership; WB = well-being; IWB = innovative work behaviour; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; VAF = variance accounted for. Direct effect (c′) represents the association between the predictor and outcome after accounting for the mediator; indirect effect (ab) represents the estimated effect through WB; total effect (c) = c′ + ab. VAF = (ab/c) × 100%. Complementary mediation indicates

significant direct and indirect effects in the same direction; competitive mediation indicates significant effects in opposite directions; indirect-only mediation indicates a significant indirect effect with a nonsignificant direct effect. $p < .05$ for effects marked with an asterisk. Indirect-effect significance is supported by the reported 95% CIs excluding zero. Dashes indicate that VAF is not interpreted because the direct and indirect effects have opposite signs.

6. Findings and Discussion

The findings indicate that teacher well-being significantly mediates the relationship between transformational leadership (TL) and IWB. This pattern is consistent with the JD-R model, in which leader support, autonomy and a clear vision act as job resources that enhance well-being and, through it, work outcomes such as innovation [5]. The Broaden-and-Build theory [14] explains why: the positive emotions that accompany well-being broaden teachers' cognitive and social resources for exploring, testing and voicing new ideas in PdP. The mediation result is therefore both statistically significant and theoretically grounded as an account of the psychosocial path from leadership to teacher innovation.

The strength of the TL → well-being path ($R^2 = 0.85$, $B = 1.03$) suggests that the way school leaders build a shared vision, model professional practice and set clear performance expectations strongly affects teachers' sense of meaning, support and work balance. Higher well-being then carries leadership influence through to IWB, so that innovation emerges from a positive work climate. The strong positive relationship between well-being and IWB ($R^2 = 0.81$, $B = 0.94$) supports the premise that improving well-being is a practical lever for increasing teacher innovation.

At the dimension level, high performance expectations and intellectual stimulation had the largest indirect effects through well-being, which identifies them as the leadership practices most closely linked to innovation. Leaders who set clear, high standards and challenge teachers' thinking through critical questions, planned experimentation and support for new ideas tend to raise teachers' sense of competence, meaning and engagement. These are core elements of well-being, which in turn are associated with IWB. In SKs, the combination of high standards and intellectual stimulation appears to start a reinforcing cycle: teachers feel supported and trusted, and so are more willing to generate, promote and realize innovative PdP ideas.

The mediation patterns differ across TL dimensions. Overall TL and three of its dimensions retained a significant direct effect on IWB after well-being was accounted for, so other mechanisms, such as pedagogical self-efficacy, psychological safety or meaningful work, may also link these practices to innovation. Individual support and high performance expectations, by contrast, influenced IWB only through well-being, which suggests that these practices encourage innovation mainly by making teachers feel supported and capable. For professional practices and values, the negative direct effect suggests that when leaders model practices and set professional norms without improving well-being, teachers may follow established routines rather than experiment. Well-being offsets this tendency, which makes it particularly important for this dimension. Future research could test these complementary and competing mechanisms. For practice, the findings indicate that leadership interventions that build well-being remain a central strategy for enhancing teacher innovation.

The main practical implication is to place well-being at the center of leadership strategies for innovation. Within the JD-R framework, leaders can add job resources by clarifying vision and expectations, giving time and space for teaching experiments, recognizing effort as well as results, and building safe professional collaboration for trying new ideas. In line with the Broaden-and-Build theory, investment in positive emotions and supportive working relationships may expand teachers' capacity to innovate. The findings thus support a shift in school strategy from demanding innovation to creating the well-being conditions that make innovation more sustainable and inclusive.

In SKs that differ in demographics and resources, transformational leadership that emphasizes high performance expectations and intellectual stimulation, while supporting well-being through tangible help and a climate that rewards effort, may produce more sustained gains in IWB. Theoretically, the mediation findings specify well-being as a mechanism linking leadership and innovation. Practically, they support prioritizing well-being-based interventions as a direct route to enhancing teacher innovation in PdP.

7. Conclusion

This study found that teacher well-being significantly mediates the relationship between transformational leadership (TL) and IWB in national schools. The indirect effect of TL on IWB through well-being was significant (95% bootstrap CI based on 5,000 samples), which supports the hypothesis that part of the influence of TL on teacher innovation operates through teacher well-being. The effect of TL on IWB is therefore partly direct and partly transmitted through well-being, which acts as a psychosocial link between leadership and innovation.

All main hypotheses were supported: TL had a positive and significant effect on IWB and on well-being, well-being was positively related to IWB, and the mediation hypothesis (Ha4) was supported. Descriptive results showed high levels of TL practice, IWB and well-being, and the mediation analysis identified well-being as a key mediator. Strengthening TL practice while attending to teacher well-being thus appears to be an effective strategy for increasing teacher innovation in PdP.

Theoretically, these findings add to the leadership and workplace well-being literature by showing that teacher innovation is higher when TL creates a supportive and meaningful work climate. Practically, they give school leaders direction: systematic investment in well-being (for example, clear vision and expectations, intellectual stimulation, recognition of effort, and emotional and professional support) may strengthen the effect of TL on IWB. Improving well-being is therefore a strategic lever for translating transformational leadership into sustained classroom innovation.

8. Recommendation

Because teacher well-being significantly mediates the relationship between TL and IWB, we recommend that schools make well-being a leadership priority in the School Development Plan. School leaders should combine the two TL dimensions with the largest indirect effects (high performance expectations and intellectual stimulation) with tangible well-being measures: protected weekly time for teaching experiments, psychologically safe peer coaching through professional learning communities (PLCs), recognition based on effort and progress, and fewer non-essential administrative tasks during the innovation cycle. The JD-R framework supports this strategy, since leader support and autonomy act as job resources that reduce stress, increase motivation and well-being, and thereby foster IWB [5]. Treating well-being as a prerequisite should therefore increase the effect of TL on IWB more than demanding innovation without an environment that sustains it.

At the system level, the MOE, IAB and the state and district education offices (JPN/PPD) are encouraged to strengthen leadership training, such as the NPQEL modules and follow-up courses, with an emphasis on applying TL to improve teacher well-being and innovation. Training should cover setting clear work standards, modeling professional practice, building trust and stimulating teachers' critical thinking without adding unnecessary pressure. The JPN/PPD could also run workshops and action clinics based on local findings to develop head teachers' professional practice. At the school level, leadership teams could administer a short instrument such as the TSWQ each term as a well-being check, together with an IWB assessment, so that well-being and innovation data become part

of routine school improvement without excessive administrative burden. These steps would help build the combination of TL practice, teacher well-being and IWB that sustains innovation in schools.

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