

Teachers' Psychological Wellbeing as a Mediator between Principals' Transformational Leadership and Teaching Quality: Evidence from Structural Equation Modeling

Nor Afnan^{*}, Sri Utaminingsih, Gunawan Setiadi

Universitas Muria Kudus, Indonesia

fanansyanor45@gmail.com*

Abstract

Improving the quality of education in the modern era demands pedagogical readiness as well as optimal teacher stress management amidst high workloads. This study aims to analyze the structural relationship between Transformative Leadership (Trans), Teacher Well-Being (Wellb), and Learning Quality (Qual). Using a quantitative method with Structural Equation Modeling (SEM) testing, data were collected from 253 elementary school teachers in Kudus Regency who were randomly selected through a simple random sampling technique based on the Slovin formula with a 5% error tolerance. The results of the structural model testing indicate a model fit with the empirical data. Hypothesis testing revealed that Teacher Well-Being is the most dominant determinant with a strong positive influence on Learning Quality (coefficient 0.81), while Transformative Leadership does not have a direct influence (-0.00) but functions as an indirect supporting factor with a weak positive correlation (0.09) with teacher well-being. The novelty of this study lies in placing the internal psychological aspects of teachers as the main mediator and "engine" driving learning quality, not merely a managerial byproduct. The research recommendations urge policymakers to shift their focus from merely principal managerial training to investing in teacher mental health and well-being to create sustainable, adaptive quality education.

Keywords: Teachers' Psychological Wellbeing, Principals' Transformational Leadership, Teaching Quality

INTRODUCTION

The evolving landscape of global education increasingly demands that teachers not only master subject matter knowledge but also continuously grow professionally to practice pedagogy effectively in a rapidly changing environment (Alvarez et al., 2025; Wu & Lin, 2025). Concurrently, teacher wellbeing (TWB) characterized by positive feelings and effective functioning in professional roles has become vital for the overall functioning of education systems (Alfaro et al., 2023; Tov et al., 2022). TWB significantly impacts individual mental, emotional, and physical health, while simultaneously influencing student wellbeing, education quality, and academic outcomes. However, the teaching profession currently faces a global crisis of attrition and shortage, with 44 million additional teachers required worldwide. This urgency is fueled by high levels of stress, anxiety, and burnout, which were heavily exacerbated by the COVID-19 pandemic (Patrinos, 2022). In many contexts, more than half of surveyed teachers report extreme stress, frequently citing health and wellbeing concerns as primary motives for attrition. Consequently, addressing teacher wellbeing transcends occupational health, emerging as a fundamental requirement for educational sustainability and the achievement of United Nations Sustainable Development Goals (SDG 3 and 4).

Despite its evident importance, conceptualizing wellbeing remains a complex challenge. Historically, teacher wellbeing frameworks have adopted a deficit approach, focusing on negative elements like stress and burnout rather than strengths-based perspectives such as resilience and flourishing (Booker & Johnson, 2024; Yotsidi et al., 2023). While elevated employee wellbeing is associated with greater job satisfaction and organizational commitment, the practical reality in many schools involves chronic work-related stress marked by emotional exhaustion. There is a critical need to understand wellbeing as a multifaceted phenomenon encompassing physical, psychological, and professional domains. Psychological wellbeing (PWB), specifically, entails an individual's evaluation of and satisfaction with their emotions, performance, and functionality over time (Highland et al., 2022; Lightsey & Smith, 2024). For educators, this functionality is an essential prerequisite for effective teaching; teachers with high PWB are better equipped to cultivate positive student relationships, manage classroom environments, and stimulate deep student learning (Ritzman & Subramanian, 2024; Rong et al., 2022).

A phenomenon gap analysis reveals a stark contrast between the theoretical recognition of wellbeing and the actual lived experiences of teachers facing escalating job expectations and limited autonomy (Agarwal & Raghav, 2024; Yépez-Tito et al., 2022). Teachers often operate in high-demand, low-resource environments where the mismatch between professional passion and systemic constraints deeply affects their fulfillment and agency. Furthermore, the educational context frequently lacks universally accepted frameworks to support holistic wellbeing (Lu et al., 2019). While scholars identify safety, support, valuation, and trust as core components of teacher wellbeing at work, these elements are routinely overlooked in institutional policy. This "wellbeing paradox" underscores how educators driven by a strong sense of calling can be overwhelmed if the institutional environment fails to provide necessary psychological and organizational resources (Ge et al., 2022; Souto et al., 2022).

School leadership, particularly principals, represents a crucial organizational resource capable of bridging this gap by establishing a supportive work environment (Caldwell et al., 2024; Hur & Lee, 2019). Transformational leadership characterized by behaviors that inspire, motivate, and intellectually stimulate followers while providing individualized support serves as a cornerstone of school improvement (Gumus et al., 2018; Guerrero et al., 2019; Lips-Wiersma & Hall, 2007; Minckler, 2014; Sahertian & Effend, 2022). Theoretically, it is operationalized through four key dimensions: idealized influence (charismatic modeling), inspirational motivation (communicating a compelling vision), intellectual stimulation (encouraging innovation), and individualized consideration (attending to unique professional needs). According to the Job Demands-Resources (JD-R) model, transformational leadership functions as a critical job resource that buffers the impact of high job demands, protecting teachers from emotional exhaustion, enhancing motivation, and fostering a positive school climate (Alkhayyal & Bajaba, 2024; Ke et al., 2025; Lips-Wiersma & Hall, 2007; Mehdinezhad & Nouri, 2016; Ozdogru et al., 2025; Zeijen et al., 2024).

The mediation between leadership and teaching quality is predominantly embedded within the psychological wellbeing of the teacher (Alamos et al., 2022; Butler et al., 2022; Harrison et al., 2025). PWB encapsulates an educator's capacity to flourish and maintain a sustainable sense of purpose, understood through both hedonic (positive affect and life satisfaction) and eudaimonic (self-actualization and personal growth) lenses (Harrison et al., 2025; Zhou et al., 2025). A widely validated framework identifies six core dimensions of PWB: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Context-relevant indicators emphasize that positive interactions with school leaders provide the emotional resilience needed to manage classroom challenges, serving as the "heart" of teacher wellbeing (Tov et al., 2022). Within the JD-R framework, when teachers perceive their leaders as

transformational, their PWB is enhanced because their basic psychological needs for autonomy and competence are satisfied (Xu et al., 2024).

Consequently, heightened wellbeing equips teachers to optimize teaching quality (or instructional quality), which directly influences students' cognitive and motivational progress (Hamash et al., 2024; Seher et al., 2021). Research operationalizes instructional quality through a tripartite structure: a supportive climate (student-oriented care and feedback), effective management (efficient classroom organization and disruption prevention), and cognitive activation (pedagogical practices challenging higher-order thinking) (Khine, 2024; Lai, 2024; Obrero-Gaitán et al., 2021; P Madanipour & Cohrsen, 2020; Papaioannou et al., 2023). Integrated conceptually, transformational leadership acts as a catalyst that enhances teachers' psychological resources, serving as the internal "engine" that translates leadership-driven initiatives into high-quality instructional practices and educational sustainability.

Despite these theoretical links, a significant research gap persists regarding the internal mechanisms through which transformational leadership influences teaching quality. The "black box" of how leadership practices translate into actual pedagogical effectiveness remains empirically unclear, as most studies focus strictly on direct effects (Chen et al., 2025; Parian Madanipour & Cohrsen, 2020; Yu, 2025). Furthermore, teachers' holistic psychological wellbeing encompassing emotions, life purpose, and self-acceptance remains critically underrepresented as a central mediator in the leadership-to-teaching-quality chain, with prior research favoring narrow metrics like job satisfaction or stress reduction (Hirsh & Segolsson, 2019; Seher et al., 2021; Timperley, 2006). Additionally, empirical evidence is predominantly derived from Western contexts, leaving culturally specific dynamics within hierarchical or collectivist educational systems largely underexplored (Da Fonseca Oliveira et al., 2015).

The novelty of this research lies in its integrative approach, positioning teachers' psychological wellbeing as the primary mediator between transformational leadership and teaching quality within a comprehensive Structural Equation Modeling (SEM) framework. Drawing on the JD-R model and Self-Determination Theory (SDT), this study investigates how leadership-driven resources fulfill basic psychological needs, thereby fostering eudaimonic wellbeing and pedagogical excellence. Utilizing SEM allows for a nuanced, systemic analysis of how these variables interact rather than treating them as isolated predictors.

METHOD

This research applies quantitative methods with testing. *Structural Equation Modeling (SEM)* to analyze the structural relationship (Fu et al., 2022; Hsu et al., 2022; Tan et al., 2025) between the variables of Transformative Leadership (Trans), Teacher Well-Being Conditions (Wellb), and Learning Quality (Qual). The population in this study were elementary school teachers in Kudus Regency, with a sample of 253 teachers selected randomly using a simple random sampling technique. The determination of the sample size was calculated precisely using the Slovin formula at a tolerance level of error (margin of error) of 5%, so that the number of samples obtained was considered very representative to represent the population of elementary school teachers in the region.

Research data was collected through three main instruments: the Transformative Leadership Scale, the Teacher Well-Being Scale, and the Teacher Learning Quality Scale. Before being used in the actual research, all three instruments were declared valid through an Expert Validation Test using Inter-rater Agreement analysis, with very good results. The following is a summary of expert agreement values for each scale, which can be seen in Table 1:

Table 1. Instrument Feasibility Test from Experts

Research Instruments	Coefficient Value (Aiken's V)	Eligibility Category
Transformative Leadership Scale (Trans)	0,88	Very Worthy
Condition Scale <i>Well-Being</i> Teacher (Wellb)	0,91	Very Worthy
Teacher Learning Quality Scale (Qual)	0,86	Very Worthy

Table 1 shows that this instrument was deemed highly suitable by the validators, with an Aiken's V value above 0.86. Furthermore, the three instruments underwent a comprehensive trial phase to measure their item validity and reliability. This trial involved 20 teachers outside the main research sample but with similar population characteristics. The results of the statistical analysis showed that all statement items on the three scales had Corrected Item-Total Correlation values that exceeded the minimum r-table limit, as well as Cronbach's Alpha values that were well above the standard threshold (0.60), which proved that this instrument has a very reliable internal consistency for use in SEM modeling.

Table 2. Results of Validity and Reliability Tests (n = 20)

Research Variables	Validity Determinatio n (r-count)	Reliability Coefficient (Cronbach's α)	Instrument Status
Transformative Leadership (Trans)	0,78	0,84	Valid & Reliable
Condition <i>Well-Being</i> Teacher (Wellb)	0,83	0,89	Valid & Reliable
Quality of Learning (Qual)	0,75	0,81	Valid & Reliable

Table 2 shows that, empirically, all instruments can be considered valid and reliable. This is evidenced by validity test results averaging above 0.75 and reliability coefficients exceeding 0.81.

RESULT AND DISCUSS

Findings

The first test conducted in this study was a model fit test to determine the estimates, such as Classical (Standard), Robust, and Scaled. Experts generally recommend reporting Robust or Scaled values (especially if your data is not perfectly normally distributed). The results showed that all three types of estimates consistently showed very good results, as outlined in Table 3.

Table 3. Fit indices

Type	SRMR	RMSEA	95% Confidence Intervals		RMSEA p
			Lower	Upper	
Classical	0.045	0.000	0.000	0.037	0.997
Robust	0.028	0.000	0.000	0.033	0.999
Scaled	0.028	0.010	0.000	0.040	0.994

Table 3 shows that the model fit test, SRMR, and RMSEA values (both classical, robust, and scaled) have met the specified cut-off standards. Thus, the structural model proposed in this study is deemed to be a good fit with the empirical data, allowing the analysis to proceed to hypothesis testing. *SRMR* (*Standardized*

Root Mean Square Residual) A value of 0.028 is well below 0.08, meaning the difference between the sample covariance matrix and the model covariance matrix is very small, indicating a very accurate model. Furthermore, your RMSEA value, which reaches 0.000 (or 0.010 in Scaled), indicates that the model's approximation error is almost non-existent, indicating a very ideal result.

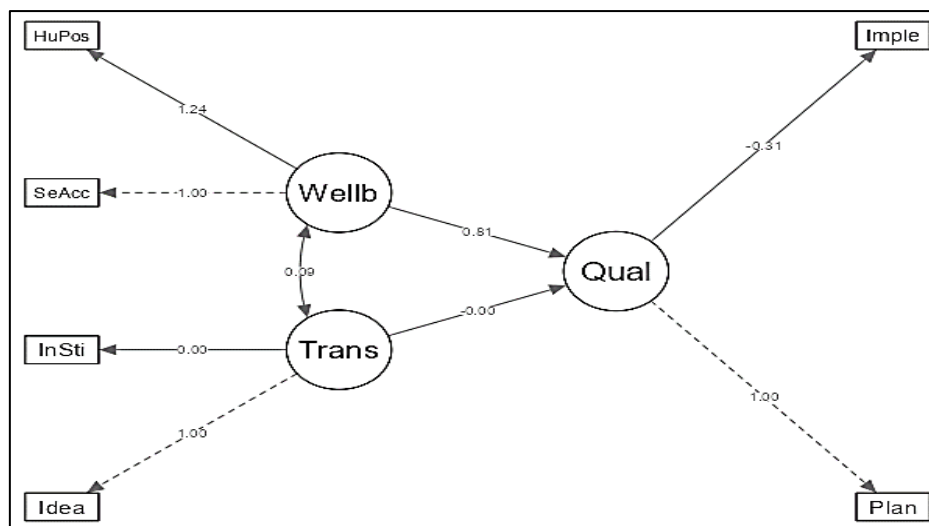
The next step is to test the Reliability Indices to determine whether the requirements are met. convergent validity and composite reliability requirements in this modeling. The results are presented in Table 4.

Tabel 4. Reliability indices

Variable	a	Ordinal a	oh ₁	oh ₂	oh ₃	AVE
Trans	0.555	0.776	0.83701	0.83701	0.83701	0.7407
Wellb	0.954	0.928	0.9019	0.9019	0.9019	0.498
Which	-0,6	-0,878	0.855	0.855	0.855	0.751

Table 4 shows that Based on the latest reliability index table, the three research variable instruments are considered valid and reliable for use in the SEM model because they have met the main parameter threshold. The Transformative Leadership ('Trans') variable shows very strong convergent validity with an AVE value of 0.7407 and reliable composite reliability through a McDonald's Omega value of 0.83701. The Teacher Well-Being Condition ('Wellb') is proven to have excellent internal consistency with an Alpha value of 0.954 and Omega 0.9019, supported by an AVE value of 0.498 which meets the eligibility standard. Meanwhile, the Learning Quality ('Qual') variable has very high convergent validity with an AVE of 0.751 and is declared reliable based on a solid Omega value of 0.855, although its negative conventional Cronbach's Alpha value (-0.6) indicates the need for re-examination of the reverse coding of the instrument's statement items.

The next step is to carry out testing model *Structural Equation Modeling* (SEM) to see how the relationship between the latent variables. The results are as presented in Figure 1.



Picture 1. Stuctural Wquation Modelling of Tranformational Leadership, Psychological Well-being and Teaching Quality

Based on Figure 1, it is known that there is a positive and very strong direct influence of the Teacher Well-Being (Wellb) variable on the Quality of Learning (Qual) with a path coefficient of 0.81. This figure indicates that the better the psychological and emotional well-being (well-being) conditions perceived by teachers, the more it will be followed by a significant increase in the quality of the learning process they provide in the classroom. Furthermore, it is also known that the direct relationship between Transformative Leadership (Trans) and the Quality of Learning (Qual) shows a path coefficient of -0.00. This figure indicates that the principal's transformative leadership style directly has no influence or impact at all on the rise or fall of the quality of learning in the classroom in this model. This model shows a two-way relationship (correlation/covariance) between the Transformative Leadership (Trans) and Teacher Well-Being (Wellb) variables with a value of 0.09. This relatively small value indicates a weak positive relationship between teachers' perceptions of transformative leadership and their own well-being conditions.

This model suggests that Teacher Well-Being (Wellb) is a key factor and the most dominant determinant in driving Learning Quality (Qual). Meanwhile, Transformative Leadership (Trans) is unable to directly influence learning quality. However, given the positive correlation (0.09) between Trans and Wellb, transformative leadership likely works indirectly, acting as a supporting factor in building teacher well-being first, which ultimately has a linear impact on increasing the quality of learning in schools.

Discussion

The findings of this study place Well-Being Guru (Wellb) as the most dominant determinant of Quality of Learning (Qual), as well as positioning Transformative Leadership (Trans) as an indirect supporting factor, making a significant contribution to contemporary educational management literature.

Teacher Well-Being: The Key Axis of Learning Quality

Findings Teacher Well-Being is a key factor and the most dominant determinant in driving the Quality of Learning in line with the premise that teachers are the "pivot" of effective education delivery (Tseer et al., 2024). Existing literature consistently shows that teacher well-being has a profound impact not only on individual physical and mental health, but also on the overall education ecosystem, including the quality of education and student academic outcomes (Öztürk et al., 2024; Vo et al., 2024). Teachers with high levels of psychological well-being (PWB) tend to demonstrate better academic performance and are able to create positive relationships in the classroom, which directly improves student achievement (Mao & Zhang, 2025). Conversely, low teacher well-being is considered a threat to the quality of education; teachers who experience stress or burnout are less able to provide warm, responsive, and engaging interactions that students need to develop social-emotional and cognitive skills (Bailenson et al., 2025; Simons et al., 2022).

In the "prosocial classroom" model, teachers' social and emotional well-being directly impacts their ability to build relationships and manage classrooms in ways that create optimal experiences for children (Markowitz et al., 2024). Empirical data supports this, with well-being variables such as subjective happiness being a key aspect of teachers' quality of life that is strongly related to their ability to adapt professionally (Us et al., 2024). Thus, your findings suggesting a linear impact between *well-being* and the soaring quality of learning is strongly supported by the theory that teachers who feel supported, valued, and have meaning in their profession will be more effective in their teaching practice (Sadeghi & Pourbahram, 2024; Us et al., 2024).

The Role of Transformative Leadership as a Supporting Factor

Although the study found that Transformative Leadership does not directly affect the quality of learning, the positive correlation (0.09) found indicates the role of leadership as a provider of crucial organizational resources. In the framework *Job Demands-Resources* (JD-R), transformational leadership serves as a resource that protects teachers from *burnout* and emotional exhaustion by providing vision, individual support, and intellectual stimulation (Iqbal et al., 2025; J. Liu et al., 2025). Transformative leadership works by building "teacher admiration" (*teacher admiration*) and "cognitive empathy" which then becomes an emotional mechanism to increase teacher resilience to stress (L. Liu et al., 2025; Qi et al., 2025).

Literature suggests that effective leadership, especially in stressful environments, helps alleviate job demands and build teacher self-confidence. Although its impact on teaching quality may not always be direct, transformative leadership creates a positive school climate, which in turn facilitates teacher engagement and job satisfaction (L. Liu et al., 2025). Your findings suggest that this leadership works indirectly through building *well-being* teachers first is consistent with studies stating that instructional and transformative leadership often work through mediating variables such as teacher professional learning or job satisfaction to influence learning outcomes (Huang et al., 2024; Ly et al., 2026).

Advantages The main finding of this study is the explicit emphasis on *well-being* as a primary driver of quality, not simply a byproduct of leadership. While many previous studies have tended to position leadership as the most powerful independent variable, your research provides a more human-centered perspective by positioning teachers' internal conditions as the primary driver of quality (Daniels et al., 2025). This provides strong validation for policies seeking to improve educational standards through direct interventions on staff well-being, rather than simply managerial training for principals (Tseer et al., 2024).

There is short age or differences that need to be considered. A correlation of 0.09 between the Transformational Leadership style and *Well-Being* in this study is relatively small when compared with some literature that shows a stronger relationship between leadership and job satisfaction or reduction *burnout* (Ghamrawi et al., 2023). This may indicate the presence of other moderating variables that have not been uncovered in your model, such as "teacher sense of responsibility" (*sense of responsibility*) or "altruism," which other studies have shown to strengthen the impact of leadership on well-being and commitment (Qi et al., 2025). Furthermore, the absence of a direct influence of leadership on learning quality in your study may be influenced by the structural context of the school, such as excessive workloads or rigid bureaucratic policies, which can blunt the effectiveness of direct leadership on pedagogy.

Implications for Scientific Development

Based on the discussion above, here are some recommendations for the next scientific development, namely Future research should consider individual psychological variables such as resilience (*resilience*), tenacity (*grit*), or altruism as a moderator. This is important to understand why, in some contexts, transformational leadership has a low correlation with teacher well-being. Furthermore, Whole School Approach (*Whole-School Approach*) The practical implication of these findings is the need to adopt a whole-school approach to monitoring and promoting *well-being* the entire school population. Education policy must shift from simply "curriculum access and coverage" to "prioritizing teacher mental health" as a sustainability strategy. Equally important is Adaptive Leadership Development: Given the indirect role of transformational

leadership, principal training should focus on enhancing emotional intelligence and the ability to create a “safe base” (*secure base*) for teachers. This will help teachers feel psychologically safe to innovate in learning. This research confirms that investing in people in this case, teacher well-being is the most impactful investment in educational quality. Transformative leadership remains relevant not as a technical determinant of teaching, but as a supportive ecosystem that ensures teachers are in the best psychological state to teach.

CONCLUSION

This study concludes that Teacher Well-Being (Wellb) is a key factor and the most dominant determinant that has a strong positive influence on improving the Quality of Learning (Qual). Conversely, Transformative Leadership (Trans) does not have a direct influence, but rather functions as an indirect supporting factor through the formation of teacher psychological well-being. Implications for scientific development emphasize the urgency of integrating teachers' internal psychological variables as the main mediator in contemporary educational management theory. For professional development, these findings emphasize the importance of creating a psychologically safe workspace to support teachers' pedagogical competence. Recommendations for further research suggest integrating individual moderating variables such as resilience or altruism. Finally, for policymakers, it is recommended to shift the paradigm of school evaluation from a purely administrative-curricular orientation to policies that prioritize teacher mental health and well-being as a strategy for sustaining educational quality.

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REFERENCE

- Agarwal, A., & Raghav, D. (2024). Modelling key drivers of employee behaviour for personal and professional excellence. *Psychology Research and Behavior Management*, 17, 2179–2194. <https://doi.org/10.2147/PRBM.S448469>
- Alamos, P., Corbin, C. M., Klotz, M., Lowenstein, A. E., Downer, J. T., & Brown, J. L. (2022). Bidirectional associations among teachers' burnout and classroom relational climate across an academic year. *Journal of School Psychology*, 95, 43–57. <https://doi.org/10.1016/j.jsp.2022.09.001>
- Alfaro, J., Carrillo, G., Aspillaga, C., Villarroel, A., & Varela, J. (2023). Well-being, school and age, from the understandings of Chilean children. *Children and Youth Services Review*, 144, Article 106739. <https://doi.org/10.1016/j.childyouth.2022.106739>
- Alkhayyal, S., & Bajaba, S. M. (2024). Countering technostress in virtual work environments: The role of work-based learning and digital leadership in enhancing employee well-being. *Acta Psychologica*, 248, Article 104377. <https://doi.org/10.1016/j.actpsy.2024.104377>
- Alvarez, J., de Lima Caneppele, F., Gomez Tobias, R., Segura-Dominguez, C., Navarrete-Bear, M., & Hidalgo, J. (2025). Educational innovation in engineering: Integrating Virtual Reality and Artificial Intelligence in first-year student training. Dalam C. da R. Brito & M. M. Ciampi (Ed.), *Proceedings*

of the Institute of Electrical and Electronics Engineers Inc.
<https://doi.org/10.1109/EDUNINE62377.2025.10981372>

- Bailenson, J. N., DeVeaux, C., Han, E., Markowitz, D. M., Santoso, M., & Wang, P. (2025). Five canonical findings from 30 years of psychological experimentation in virtual reality. *Nature Human Behaviour*, 9(7), 1328–1338. <https://doi.org/10.1038/s41562-025-02216-3>
- Booker, J. A., & Johnson, C. L. (2024). Personality and resilience in a jarring time: Self-compassion and hope before and during COVID disruptions. *Emerging Adulthood*. <https://doi.org/10.1177/21676968241257000>
- Butler, N., Quigg, Z., Bates, R., Jones, L., Ashworth, E., Gowland, S., & Jones, M. (2022). The contributing role of family, school, and peer supportive relationships in protecting the mental wellbeing of children and adolescents. *School Mental Health*, 14(3), 776–788. <https://doi.org/10.1007/s12310-022-09502-9>
- Caldwell, H., Whewell, E., West, A., & Tiplady, H. (2024). Novel spaces as catalysts for change: Transformative learning through transnational projects. *Education Sciences*, 14(9), Article 954. <https://doi.org/10.3390/educsci14090954>
- Chen, C., Wang, Y., Zhang, W., Wang, J., Li, Q., & Sha, K. (2025). Research on the model construction and innovative path of smart education empowering medical education reform. *Proceedings of ACM Conference*, 310–317. <https://doi.org/10.1145/3744367.3744417>
- Da Fonseca Oliveira, B. M., Moriano, J. A., Laguía, A., & Soares, V. J. S. (2015). The psychosocial profile of the entrepreneur: A study from the point of view of gender [El perfil psicosocial del emprendedor: Un estudio desde la perspectiva de género]. *Anuario de Psicología*, 45(3), 301–315.
- Daniels, M., Flynn, S., & Kelly, J. (2025). Advancing project leadership education through AI-enhanced game-based learning. *Project Leadership and Society*, 6, Article 100189. <https://doi.org/10.1016/j.plas.2025.100189>
- Fu, X., Yan, T., Tian, Y., Niu, X., Xu, X., Wei, Y., Hu, Q., Ouyang, Z., & Wu, X. (2022). Exploring factors influencing students' entrepreneurial intention in vocational colleges based on structural equation modeling: Evidence from China. *Frontiers in Psychology*, 13, Article 898319. <https://doi.org/10.3389/fpsyg.2022.898319>
- Ge, B., Ma, Z., Li, M., Li, Z., Yang, L., & Liu, T. (2022). Influential pathways of employees' career growth: Linkage of psychological and organizational factors based on qualitative comparative analysis. *Frontiers in Psychology*, 12, Article 796454. <https://doi.org/10.3389/fpsyg.2021.796454>
- Ghamrawi, N., Naccache, H., & Shal, T. (2023). Teacher leadership and teacher wellbeing: Any relationship? *International Journal of Educational Research*, 122, Article 102261. <https://doi.org/10.1016/j.ijer.2023.102261>
- Guerrero, E. G., Khachikian, T., Frimpong, J. A., Kong, Y., Howard, D. L., & Hunter, S. (2019). Drivers of continued implementation of cultural competence in substance use disorder treatment. *Journal of Substance Abuse Treatment*, 105, 5–11. <https://doi.org/10.1016/j.jsat.2019.07.009>
- Gumus, S., Bellibas, M. S., Esen, M., & Gumus, E. (2018). A systematic review of studies on leadership models in educational research from 1980 to 2014. *Educational Management Administration & Leadership*, 46(1), 25–48. <https://doi.org/10.1177/1741143216659296>
- Hamash, M., Ghreir, H., & Tiernan, P. (2024). Breaking through barriers: A systematic review of extended reality in education for the visually impaired. *Education Sciences*, 14(4), Article 365. <https://doi.org/10.3390/educsci14040365>

- Harrison, M. G., Wang, Y., Cheng, A. S., Ka, C., Tam, Y., Pan, Y., & King, R. B. (2025). School climate and teacher wellbeing: The role of basic psychological need satisfaction in student- and school-related domains. *Teaching and Teacher Education*, 153, Article 104819. <https://doi.org/10.1016/j.tate.2024.104819>
- Highland, B., Worthington, E. L., Davis, D. E., Sibley, C. G., & Bulbulia, J. A. (2022). National longitudinal evidence for growth in subjective well-being from spiritual beliefs. *Journal of Health Psychology*, 27(7), 1738–1752. <https://doi.org/10.1177/13591053211009280>
- Hirsh, Å., & Segolsson, M. (2019). Enabling teacher-driven school-development and collaborative learning: An activity theory-based study of leadership as an overarching practice. *Educational Management Administration & Leadership*, 47(3), 400–420. <https://doi.org/10.1177/1741143217739363>
- Hsu, C., Chen, Y., Lin, C., & Lien, W. (2022). Cognitive development, self-efficacy, and wearable technology use in a virtual reality language learning environment: A structural equation modeling analysis. *Current Psychology*, 41(3), 1618–1632. <https://doi.org/10.1007/s12144-021-02252-y>
- Huang, L., Zhao, D., & Zhou, S. (2024). Examining principal instructional leadership effects on the rural-urban instructional quality gap in China: The mechanism of teacher professional learning. *Studies in Educational Evaluation*, 81, Article 101346. <https://doi.org/10.1016/j.stueduc.2024.101346>
- Hur, Y., & Lee, K. (2019). Identification and evaluation of the core elements of character education for medical students in Korea. *Journal of Educational Evaluation for Health Professions*, 16, Article 21. <https://doi.org/10.3352/jeehp.2019.16.21>
- Iqbal, S., Zhong, X., Khan, M. A., Wu, Z., AlHammadi, D. A., Liu, W., & Choudhry, I. A. (2025). Continual and wisdom learning for federated learning: A comprehensive framework for robustness and debiasing. *Information Processing and Management*, 62(5), Article 104157. <https://doi.org/10.1016/j.ipm.2025.104157>
- Ke, W., Peng, L., & Wang, L. (2025). Effects of college students' perceived transformational leadership of physical education teachers on their exercise adherence: Serial-mediated roles of physical self-efficacy and exercise motivation. *Acta Psychologica*, 254, Article 104878. <https://doi.org/10.1016/j.actpsy.2025.104878>
- Khine, M. S. (2024). *Motivation science: A machine-generated literature overview*. Springer Singapore. <https://doi.org/10.1007/978-981-97-9247-4>
- Lai, C. (2024). Enhancing multimodal output in CLIL education: The impact of VR games on fourth-grade students' English poster designs and presentations in Taiwan. *Humanities and Social Sciences Communications*, 11(1), Article 1380. <https://doi.org/10.1057/s41599-024-03999-y>
- Lightsey, O. R., & Smith, B. N. (2024). Resilience, generalized self-efficacy, and mindfulness as moderators of the relationship between stress and well-being. *Journal of Cognitive Psychotherapy*, 38(1), 3–23. <https://doi.org/10.1891/JCP-2022-0004>
- Lips-Wiersma, M., & Hall, D. T. (2007). Organizational career development is not dead: A case study on managing the new career during organizational change. *Journal of Organizational Behavior*, 60(1), 5–22. <https://doi.org/10.1002/job>
- Liu, J., Gao, J., & Arshad, M. H. (2025). Teacher-student relationships as a pathway to sustainable learning: Psychological insights on motivation and self-efficacy. *Acta Psychologica*, 254, Article 104788. <https://doi.org/10.1016/j.actpsy.2025.104788>
- Liu, L., Li, K., Yue, L., & Zulqarnain, M. (2025). Burnout and leadership in special education: A sustainable approach through the lens of SDG 3 and SDG 4. *Acta Psychologica*, 259, Article 105421. <https://doi.org/10.1016/j.actpsy.2025.105421>

- Lu, J., Lo, C.-L., Bang, N. M., & Romero, D. (2019). A critical review of spiritual well-being scales: Implications for research, practice, and education in rehabilitation counseling. *Rehabilitation Counseling Bulletin*, 62(3), 144–156. <https://doi.org/10.1177/0034355218776764>
- Ly, B., Sorn, S., Ly, R., Ma, S., & Doeur, B. (2026). Distributed leadership in higher education: Evidence from Cambodia on academic and institutional outcomes. *Studies in Educational Evaluation*, 88, Article 101575. <https://doi.org/10.1016/j.stueduc.2026.101575>
- Madanipour, P., & Cohrssen, C. (2020). Augmented reality as a form of digital technology in early childhood education. *Australasian Journal of Early Childhood*, 45(1), 5–13. <https://doi.org/10.1177/1836939119885311>
- Mao, M., & Zhang, M. (2025). Examining the role of psychological wellbeing in EFL teachers' pedagogical effectiveness and professional success: A structural equation modeling analysis. *Acta Psychologica*, 259, Article 105392. <https://doi.org/10.1016/j.actpsy.2025.105392>
- Markowitz, A. J., Mayaris, D., Mateus, C., & Weisner, K. (2024). Linking early educator wellbeing to classroom interactions and teacher turnover. *Early Childhood Research Quarterly*, 67, 283–294. <https://doi.org/10.1016/j.ecresq.2024.01.008>
- Mehdinezhad, V., & Nouri, F. (2016). The relationship between elementary school principals' transformational leadership and spiritual well-being. *Management in Education*, 30(2), 42–49. <https://doi.org/10.1177/0892020616643160>
- Minckler, C. H. (2014). School leadership that builds teacher social capital. *Educational Management Administration & Leadership*, 42(5), 657–679. <https://doi.org/10.1177/1741143213510502>
- Obrero-Gaitán, E., Nieto-Escamez, F. A., Zagalaz-Anula, N., & Cortés-Pérez, I. (2021). An innovative approach for online neuroanatomy and neuror rehabilitation teaching based on 3D virtual anatomical models using Leap Motion Controller during COVID-19 pandemic. *Frontiers in Psychology*, 12, Article 590196. <https://doi.org/10.3389/fpsyg.2021.590196>
- Ozdogru, M., Tulubas, T., Karakose, T., Kanadlı, S., Kardas, A., & Papadakis, S. (2025). How does teacher self-efficacy mediate the relationship between student outcomes and principal leadership for learning? Results from meta-analytic structural equation modelling (MASEM). *Acta Psychologica*, 258, Article 105144. <https://doi.org/10.1016/j.actpsy.2025.105144>
- Öztürk, Z., Bahçecioglu Turan, G., & Donmez, O. (2024). Analysis of the relationship between self-neglect and spiritual well-being in older adults. *Journal of Elder Abuse & Neglect*. <https://doi.org/10.1080/08946566.2024.2440719>
- Papaioannou, G., Volakaki, M. G., Kokolakis, S. A., & Vouyioukas, D. D. (2023). Learning spaces in higher education: A state-of-the-art review. *Trends in Higher Education*, 2(3), 526–545. <https://doi.org/10.3390/higheredu2030032>
- Patrinos, H. A. (2022). Learning loss and learning recovery. *Decision*, 49(2), 143–155. <https://doi.org/10.1007/s40622-022-00317-w>
- Qi, W., Zhang, Y., & Zulqarnain, M. (2025). Sustainable education in action: Principal leadership, teacher wellbeing, and altruism in the sports context. *Acta Psychologica*, 254, Article 104846. <https://doi.org/10.1016/j.actpsy.2025.104846>
- Ritzman, M. J., & Subramanian, R. (2024). Voices from a pandemic: Understanding how young adults on the autism spectrum use computer-mediated communication. *Autism*, 28(2), 381–389. <https://doi.org/10.1177/13623613231170963>

- Rong, Q., Lian, Q., & Tang, T. (2022). Research on the influence of AI and VR technology for students' concentration and creativity. *Frontiers in Psychology*, 13, Article 767689. <https://doi.org/10.3389/fpsyg.2022.767689>
- Sadeghi, K., & Pourbahram, R. (2024). Exploring factors affecting English language teacher wellbeing: Insights from positive psychology. *System*, 122, Article 103274. <https://doi.org/10.1016/j.system.2024.103274>
- Sahertian, P., & Effend, Y. R. (2022). Investigating the principal transformational leadership strategy in implementing character education at the senior high school level (SMA) in Indonesia. *Pegem Egitim ve Ogretim Dergisi*, 12(3), 59–68. <https://doi.org/10.47750/pegegog.12.03.08>
- Seher, A., Maqbool, K. Q., Gillani, S., Younis, A. H. M., Mustafa, M. A. U., & Fatima, A. (2021). Academic excellence in e-learning based virtual assistance. *Proceedings of the International Conference on Software Engineering and Advanced Computing*, 114–120. <https://doi.org/10.1109/SLAE54202.2021.9788100>
- Simons, C., Harden, B. J., Lee, K. A., & Tirrell-Corbin, C. (2022). Infant-toddler teachers' early adversity, current wellbeing, and engaged support of early learning. *Early Childhood Research Quarterly*, 61, 158–169. <https://doi.org/10.1016/j.ecresq.2022.07.001>
- Souto, I., Brito, E., & Pereira, A. (2022). Self-efficacy, resilience and distress: Challenges in education for sustainable entrepreneurship in a health context. *Education Sciences*, 12(10), Article 720. <https://doi.org/10.3390/educsci12100720>
- Tan, Y., Yang, T., Yang, J., & Li, K. (2025). Mediation of mathematical self-efficacy in the relationship between teacher-student relationships and mathematics achievement by grade and academic level: A multi-group structural equation modeling. *Learning and Individual Differences*, 120, Article 102696. <https://doi.org/10.1016/j.lindif.2025.102696>
- Timperley, H. S. (2006). Learning challenges involved in developing leading for learning. *Educational Management Administration & Leadership*, 34(4), 546–563. <https://doi.org/10.1177/1741143206068217>
- Tov, W., Wirtz, D., Kushlev, K., Biswas-Diener, R., & Diener, E. (2022). Well-being science for teaching and the general public. *Perspectives on Psychological Science*, 17(5), 1452–1471. <https://doi.org/10.1177/17456916211046946>
- Tseer, T., Ngmenkpiao, F., & Kanyiri, A. (2024). Unpacking the dynamics of educational access and teacher wellbeing in Ghana's free senior high school policy. *Social Sciences & Humanities Open*, 10, Article 100984. <https://doi.org/10.1016/j.ssaho.2024.100984>
- Us, P., Salavera, C., Urb, E., & Aguilar, M. (2024). Psychological wellbeing in teachers: Study in teachers of early childhood and primary education. *Heliyon*, 10(6), Article e28868. <https://doi.org/10.1016/j.heliyon.2024.e28868>
- Vo, D. T., Allen, K., & Reupert, A. (2024). Australian teachers' conceptualisations of wellbeing at work: A prototype analysis. *Teaching and Teacher Education*, 147, Article 104653. <https://doi.org/10.1016/j.tate.2024.104653>
- Wu, G., & Lin, Q. (2025). Artificial intelligence-driven innovation in language teaching and learning in vocational colleges: Paths, practices and challenges. *Proceedings of ACM Conference on Education Technology*, 345–352. <https://doi.org/10.1145/3744367.3744422>
- Xu, Y., Zhu, Q., & Chen, Y. (2024). Teacher–student relationships and college students' psychological wellbeing: The mediating role of supportive school climate. *Social Behavior and Personality*, 52(2), Article e12928. <https://doi.org/10.2224/sbp.12928>

- Yépez-Tito, P., Ferragut, M., Córdor-Guerrón, S., & Blanca, M. J. (2022). Life satisfaction and character strengths in Ecuadorian adolescents. *Child Indicators Research*, 15(2), 599–616. <https://doi.org/10.1007/s12187-021-09886-1>
- Yotsidi, V., Nikolatou, E.-K., Kourkoutas, E., & Kougoumtzis, G. A. (2023). Mental distress and well-being of university students amid COVID-19 pandemic: Findings from an online integrative intervention for psychology trainees. *Frontiers in Psychology*, 14, Article 1171225. <https://doi.org/10.3389/fpsyg.2023.1171225>
- Yu, B. (2025). Technological transformation in language learning: A systematic review of interactive learning tools from software applications to artificial intelligence driven solutions. *Proceedings of ACM Conference*, 426–432. <https://doi.org/10.1145/3744367.3744434>
- Zeijen, M. E. L., Brenninkmeijer, V., Peeters, M. C. W., & Mastenbroek, N. J. J. M. (2024). The role of personal demands and personal resources in enhancing study engagement and preventing study burnout. *The Spanish Journal of Psychology*, 27, Article e10. <https://doi.org/10.1017/SJP.2024.10>
- Zhou, S., Slep, G. R., & Vella-Brodrick, D. A. (2025). Profiling pre-service teachers' motivational and behavioral characteristics: Relationships with psychological wellbeing and occupational commitment. *Teaching and Teacher Education*, 164, Article 104846. <https://doi.org/10.1016/j.tate.2024.104846>