



## **Transformational Leadership and Behavioral Innovation in Education: A Meta-Analysis**

Suryadi<sup>1\*</sup>, Fransiskus Sawan<sup>1</sup>, Santi Anugrahsari<sup>2</sup>

<sup>1</sup>*Department of Education Management, Faculty of Science Education, Universitas Negeri Jakarta, Indonesia*

<sup>2</sup>*Faculty of Medicine and Health Sciences, Universitas Kristen Krida Wacana, Indonesia*

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### **Abstract**

Educational changes present significant challenges and opportunities for organizations to grow and develop in response to evolving demands. These changes become opportunities when accompanied by appropriate behaviors at both individual and organizational levels. This study aims to examine the impact of transformational leadership on innovative behavior based on previous studies. A meta-analysis method was employed to analyze research data using Comprehensive Meta-Analysis (CMA) software. The findings indicate that 89% of studies meeting the inclusion criteria reported a significant effect size. The placement of square boxes in the forest plot, which do not align in a straight line, suggests variation in the results among these studies. Furthermore, the average effect size of 0.338 represents the overall influence of transformational leadership on the innovative behavior of teachers or lecturers. The heterogeneity test of effect size confirms that the estimation model applied follows a random-effects model. The highest average effects were observed in five categories: international teachers (ES = 0.55), junior high school teachers (ES = 0.39), senior high school teachers (ES = 0.32), lecturers (ES = 0.30), and elementary school teachers (ES = 0.16).

### **Abstrak**

Perubahan pendidikan menghadirkan tantangan dan peluang besar bagi setiap organisasi untuk tumbuh dan berkembang seiring dengan tuntutan. Hal ini menjadi peluang setelah diikuti dengan perilaku yang benar baik pada individu maupun organisasi. Penelitian ini bertujuan untuk menguji pengaruh kepemimpinan transformasional terhadap perilaku inovatif pada sejumlah studi sebelumnya. Metode meta-analisis dengan bantuan perangkat lunak CMA digunakan untuk menganalisis data. Hasil penelitian menunjukkan bahwa 89% penelitian memberikan ukuran efek yang signifikan. Letak kotak persegi pada petak hutan yang tidak terletak pada garis lurus menunjukkan, adanya variasi hasil di antara penelitian-penelitian tersebut. Selain itu, rata-rata effect rate sebesar 0,338 merupakan ukuran pengaruh keseluruhan penelitian terhadap pengaruh kepemimpinan transformasional terhadap perilaku inovatif guru atau dosen. Sementara itu, uji heterogenitas effect size menunjukkan bahwa model estimasi yang digunakan adalah model random effect. Rata-rata pengaruh yang paling signifikan terjadi pada lima kategori, yaitu guru internasional (ES = 0,55), guru SMP (ES = 0,39), guru SMA (ES = 0,32), dosen (ES = 0,30), dan SD guru (ES = 0,16).

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\* Corresponding Author.

[hcsuryadi@unj.ac.id](mailto:hcsuryadi@unj.ac.id), Suryadi

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## INTRODUCTION

The digital era has brought an increasingly interesting discussion about innovation guided by transformational leadership styles. In education, transformational leadership is a key factor in driving behavioral innovation in academic environments (Boeckle et al., 2024). Recent studies have shown that transformational leadership not only improves academic effectiveness but also builds a culture of sustainable innovation, which enables educators and learners to develop creative solutions in the learning process. Therefore, it is important to explore how transformational leadership influences behavioral innovation in education, in order to provide broader insights into building an innovative and competitive academic ecosystem in the digital era.

Through a transformational leadership style, leaders can encourage their members to challenge the status quo and try new approaches, emphasizing the members' contributions to the organization. Therefore, they motivate the members to develop and offer new ideas to succeed the organization (Wang & Rode, 2010). Members' innovative behavior in the workplace is influenced by transformational leadership (Aryee et al., 2012). Innovative behavior is affected by leadership mediated by psychological condition, such as supports for innovation and resource supply (Scott & Bruce, 1994). In addition, innovative behavior can effectively grow through transformational leadership (Pieterse et al., 2010).

Transformational leadership is generally assumed to facilitate employee's innovation in any cultures. Examining the significance of the effect of the previous researches on this topic is interesting to research. Monoyasa et al., (2017) study on the influence of transformational leadership on human behaviors in seventeen countries. They suggest that it significantly brings about innovative behavior among individuals throughout the countries. The current research explores the combined effect of transformational leadership on innovative behavior in education in Indonesia.

A leader chooses a leadership style according to the goals to achieve within an organization. One of the popular styles is transformational leadership. It aims to motivate the employees to achieve organizational goals and satisfy their needs at a higher level. A well-implemented transformational leadership can generate satisfaction among members, and it will lead to a better performance in the organization or company. A transformational leader inspires members to enhance their interests in the organizational goals and provide tremendous influence over their members (Putra & Subudi, 2015; Robbins & Judge, 2013).

Transformational leadership can increase members' motivation, satisfy their needs, and treat them as whole human beings (Northouse, 2012). Transformational leaders hold a good vision, rhetorical expertise, and impression management and create strong emotional bonds with their members (Hughes, 2006). They inspire their members to transcend their self-interest and have profound and tremendous influence over their members. (Robbins & Judge, 2013).

Innovative behavior refers to the actions of individuals that lead to the emergence, introduction, and application of something new and profitable within an organization. It is often associated with creativity (Kleysen & Street, 2001). Innovative behavior and creativity are correlated, yet they pose different contracts. Creativity can be defined as the initial innovation process once the problems are found, and ideas come up to answer the innovation demand ( Jong & Hartog, 2007). Innovative behavior focuses on more complex processes because it addresses the application of ideas (Carmeli et al., 2006).

Scientists emphasize the significance of innovative behavior in the workplace (IWB). The measurement of creative behavior is still challenging to pin down, and it is characterized in four dimensions: opportunity exploration, idea generation, championing, and application (Jong & Hartog, 2008). The theory of innovation often states that innovation is broader than creativity, and it includes the implementation of ideas.

Innovation depends on the willingness to find opportunities and to solve problems. Opportunity exploration is the first steps to exploit opportunities. Exploring opportunities includes finding ways to improve the current service or to think about the work process, product, or service creatively. Besides, the ability to build new ways to make the most of the opportunities is also

essential. Idea generation means creation of concepts for improvement. Ideas can be related to a new product and service, entry process into a new market, an improvement in the current work, or in general, a solution to the problems.

A research by Akar (2018) shows that the negative perception of teacher on the quality of work leads to burnout and school alienation while the positive perception brings about affective commitment. In addition, their perception of affective commitment has a positive impact on their organizational behavior. Most of those ideas need to be promoted, and collaborations are required to implement innovation. Prospective users of such proposed innovations (colleagues, leaders, customers) often feel unsure of the added value of the innovations.

Behavior in the application concerns with the efforts made by individuals to implement the concept into actual practice. Innovative behavior is influenced by internal and external factors. The internal factor comprises four aspects, which are demographic diversity. (Østergaard et al., 2011), Proactive behavior (Baumann, 2011), self-leadership (Carmeli et al., 2006). And, the external factors are leadership style (Ancok, 2012; Jong & Hartog, 2007), organizational structure (Ancok, 2012), and organizational memory (Etikariena & Muluk, 2014). Leadership style is one of the main factors that levels up innovation (Ancok, 2012). Shared leadership and employee empowerment predict teacher innovation. It is essential to build a school environment in which the leader appreciates the teachers' innovation and includes them in the decision-making process to empower every single party within (Cobanoglu, 2021).

This research tries to contribute to the theory that is developing today, in particular transformational leadership and innovative work behavior in education. In addition, it provides new perspectives from learning innovative work behavior as moderation in the context of education in Indonesia. This is because transformational leadership and innovative work behavior are needed, especially various problems faced by education both schooling at every level and college. This situation is only a small part of the leadership problems faced in the era of globalization. Education requires leaders who are capable and able to provide solutions to answer the challenges of the times. So we concentrate this research on educational institutions, especially in Indonesia as role models.

## METHOD

This research uses qualitative methods with a meta-analysis approach. Meta-analysis is a research method carried out by summarizing, reviewing, and analyzing research data obtained from several pre-existing research results. Data was collected through searching articles contained in online journals and proceedings.

This research sought to analyze some of the study results as empirical data on the effect of transformational leadership on teachers' innovative behavior. It is designed by using meta-analysis method combining several preliminary research results spread in journals or published proceedings to integrate a finding (Hunter & Schmidt, 2004). It follows the stages of the meta-analysis method developed by Borenstein, M. et al. (2009) and Pigott (2012), which is determining the inclusion criteria, collecting data, and encoding variables, and conducting statistical analysis.

The primary articles as empirical data which are included in meta-analytic reviews must meet some inclusion criteria. The first, the introductory article should explicitly measure the effect of transformational leadership on the innovative behavior of lecturers and teachers of elementary and high school levels in the significance of the transformation effect, i.e., average, standard deviation and sample size. The second, the articles are published in journals or proceedings in the context of education in Indonesia. The third, the article is the work of individuals and groups in Bahasa or English published in 2017 to 2021.

The literature search is performed thoroughly so that the results are not biased. The search aims to identify various empirical data in the articles related to the transformational leadership and innovative behavior in Indonesia. The search employs electronic search strategies from the Google Scholar, Proquest, EBSCO, and Google Scholar databases using Indonesian keywords (kepemimpinan\*) AND (transformasional\*) AND (inovasi\*) OR (inovatif\*) AND (pendidikan\*) OR (guru\*) OR (dosen\*) AND (Indonesia\*) found as many as 7,590 articles. When using English

keywords, such as (leadership\*) AND (transformational\*) AND (innovation\*) OR (innovative\*) AND (education\*) OR (teacher\*) OR (lecturer\*) AND (Indonesia\*), 24,900 articles come up. Furthermore, using the inclusion criteria that have been set, in total, the search process results in 9 primary studies. (Supriadi et al., 2020; Fayzhall et al., 2020; Nurdin et al., 2020; Sunardi et al., 2019; Monoyasa et al., 2017; Suhana et al., 2019; Hidayat & Rofaida, 2021; Tjahjono & Rosyid, 2019; A. S. Putra et al., 2021).

In addition, the researchers employed empirical data encoding to correct the data in the analysis process and avoid forgetting them. Therefore, this study employs two coding people separately. The results are compared and re-verified until there is no longer difference. The empirical data encoding process includes all the information obtained from the preliminary study on the author, the year of publication, the research subject, the sample size, and the correlation value. The empirical data encoding uses instruments in the form of variable encoding sheets. The coded results are attached.

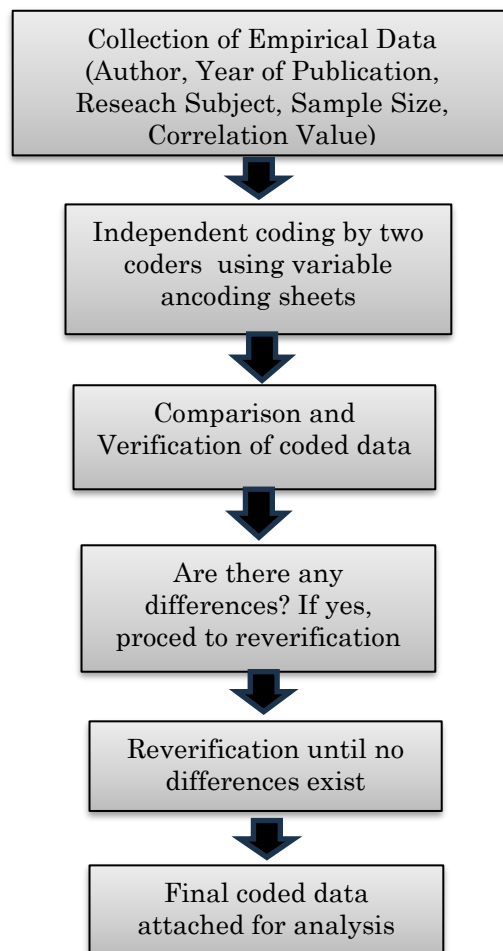


Figure 1. Steps in the empirical data encoding and verification process

The application used to analyze the data is Comprehensive Meta-Analysis (CMA). The equations of hedge are used to measure the effect size and its interpretation, using the classification of the effect size interpretation table developed by Cohen, L., Manion, L., & Morrison (2007). The CMA application is used to measure the Z value for testing the significance of transformational leadership on the innovative behavior of educators (lecturers and teachers). It provides an average effect measure with confidence intervals for each class of variables and homogeneity among groups i.e., if  $Z_{\text{calculates}} > Z_{\text{table}}$  with  $p < 0.05$ , the null hypothesis is rejected (Borenstein, M. et al., 2009). It indicated that the application of transformational leadership results in a positive measure of effect on the innovative behavior of educators (lecturers and teachers) compared to conventional

approaches. It's decided whether to get the fixed-effect or random-effect estimation model (Haidich, 2010). The fixed one indicated that the size effect is homogeneous. When the effect size is statistically heterogeneous, we use the random-effect model ( $Q_b > \chi^2_{2.95}$ ;  $p < 0.05$ ). Rejecting  $Q_b$  suggests that the effect size may not measure similar parameters (Borenstein, M. et al., 2009). Therefore, statistically, there should be significant difference in the combined effect size for each distinct group of studies.

The data are analyzed statistically by following the stages developed by Borenstein, M. et al. (2009). The first, determining the size of the effect of each research result in the article; the second, determining the heterogeneity test of the measure of the impact; the third, determining publication bias; and the fourth, calculating the p-value. Once acknowledged that the estimated model is a random-effect model, an assessment on how high the transformational leadership variables moderate the innovative behavior of educators can be made.

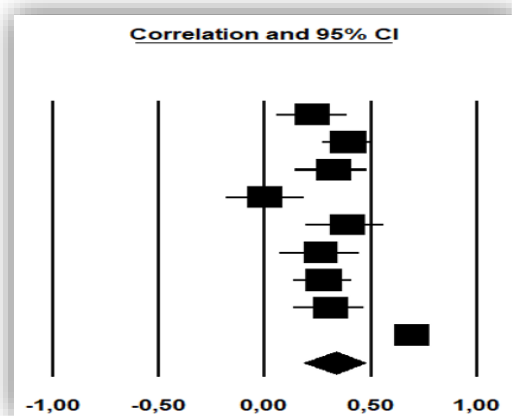
## RESULTS AND DISCUSSION

With CMA software, the researchers calculate the effect size of 9 articles about the transformational leadership on innovative behavior in education. They are presented in table 1 and figure 1.

Table 1. Calculation of articles

Study Name	Correlation	LL	UL	<i>z-value</i>	<i>p-value</i>
Supriadi et al. 2020	0.23	0.06	0.39	2.62	0.01
Fayzhall et al. 2020	0.39	0.27	0.51	5.83	0
Nurdin et al. 2020	0.32	0.15	0.48	3.48	0
Monoyasa et al. 2017	0	-0.18	0.18	0	1
Hodayat et al. 2021	0.39	0.2	0.56	3.76	0
Tjahjono et al. 2019	0.27	0.07	0.44	2.66	0.01
Putra et al. 2021	0.28	0.13	0.41	3.72	0
Sunardi et al. 2019	0.31	0.14	0.47	3.43	0
Suhana et al. 2019	0.69	0.62	0.76	12.3	0
Overall	0.34	0.18	0.48	4.12	0

Source : CMA software, 2022. Noted: LL= Lower Limit; UL= Upper Limit.



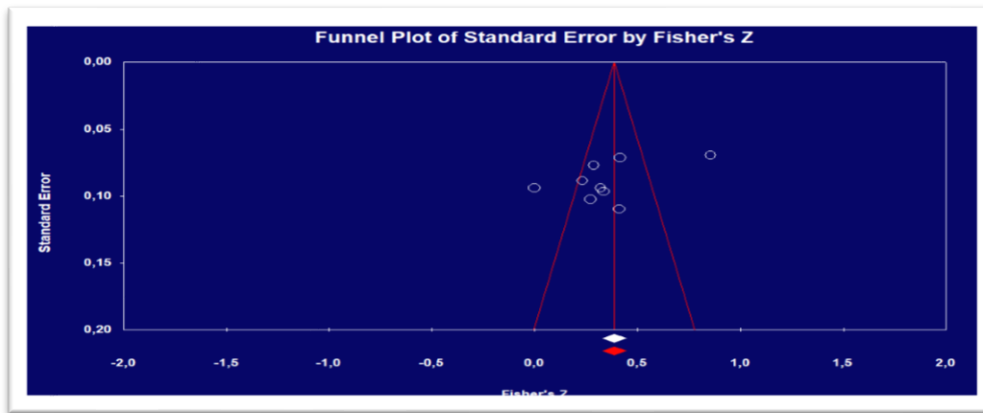
Source : CMA software, 2022

Figure 2. Research forest plot

Based the nine studies analyzed, only one study (Monoyasa et al., 2017) is insignificant (ES = 0.00). The other eight studies (89%) show that transformational leadership has a significant effect on the innovative behavior of teachers or lecturers. Moreover, Figure 1 shows that the study conducted by Suhana et al. (2019) has an effect size of more than 0.05. The other seven studies

generate an effect measure between 0.00 and 0.50. The location of the square box is not on a straight line. It reflects the degree of variation in results between studies.

Afterwards, the researchers examine the publication bias of the study. It is essential to measure whether the researchers ignore studies whose results are insignificant or inconclusive, and only publish the research that shows the influence of transformational leadership on the innovative behavior of teachers or lecturers. The test results are presented in figure 2.



Source : CMA software, 2022

Figure 3. Research funnel plot

Figure 2 shows that the observed average effect size (white diamond) with the virtual average effect size (red diamond) is on the vertical line (not shifted). It suggests no influence or indication of publication bias in the study. Thus, an average effect rate of 0.338 represents a measure of the overall effect of studies on the influence of transformational leadership on the innovative behavior of teachers or lecturers. In addition, the researchers test the effect size heterogeneity to determine the estimation method used. The summary of the results of the effect size calculations is presented in table 1.

Table 2. The results of effect size calculation

Model	NS	PE	LL	UL	z-value	p-value	q-value	df(Q)	p-value (H)	I <sup>2</sup>	T <sup>2</sup>	SE	V	T
Fixed	9	0.369	0.32	0.417	13.484	0	69.179	8	0	88.436	0.058	0.034	0.001	0.24
Random	9	0.338	0.182	0.477	4.116	0								

Noted: NS= Number of Studies; PE= Point Estimate; LL= Lower Limit; UL= Upper Limit; SE= Standard Error; V= Variance; T<sup>2</sup>= Tau-Squared; T= Tau; H= Heterogeneity.

The P-value for testing heterogeneity measures that the effect among the studies is 0.000. This value is found < of 0.05. It suggests that the effect size lies between heterogeneous studies. Therefore, the method of estimating the population uses a random effect model. Based on the random effect model, the average effect size of the study is 0.338. This value shows the great influence of transformational leadership on innovative behavior into the category of quite strong (Mukaka, 2012). The more a leader demonstrates a transformational leadership style in performing leadership roles, the more innovative behavior the subordinates will show. The result of this study is in line with Hsiao & Chang's research. (Hsiao & Chang, 2011; Abbas et al., 2012); Elrehail et al., 2018). A leader has an important responsibility in creating change through sharing innovation for school progress (Kursunoglu & Tanriogen, 2009). Transformational leadership styles can foster high trust in leaders. In this sense, everyone is more driven to innovate for the progress of the organization (Al-Husseini & Elbeltagi, 2016). Therefore, the innovative capacity of teachers or lecturers can be developed through the consistent application of transformational leadership styles (Supriadi et al., 2020).

The randomized effect model as the selected estimation method reflecting the power of transformational leadership influence on innovative behavior studies among individuals is lower than that of meta-analysis studies. It also shows the need to perform advanced analysis, which is moderator variable analysts (Jackson & Turner, 2017; Juandi & Tamur, 2021).

Table 3. The results of the moderator variable analysis

Group	NS	PE	LL	UL	z-value	p-value	q-value	df (Q)	p-value (H)	I <sup>2</sup>
Dosen	3	0.303	0.205	0.396	5.825	0	1.096	2	0.578	0
Gr Int	2	0.55	0.471	0.62	11.298	0	30.531	1	0	96.725
Gr SD	2	0.16	0.031	0.284	2.425	0.015	5.852	1	0.016	82.911
Gr SMA	1	0.324	0.146	0.482	3.477	0.001	0	0	1	0
Gr SMP	1	0.394	0.269	0.505	5.828	0	0	0	1	0
Total within							37.479	4	0	
Total between							31.7	4	0	
Overall	9	0.369	0.32	0.417	13.484	0	69.179	8	0	88.436

Source : CMA software, 2022. Noted: NS= Number of Studies; PE= Point Estimate; LL= Lower Limit; UL= Upper Limit; SE= Standard Error; V= Variance; T= Tau; H= Heterogeneity.

The moderator variables analyzed in the study are innovative behaviors. From the identification results, there are five categories found, lecturers, international school teachers, elementary school teachers, and high school teachers. The results of the analysis show that the largest average effect size of the five categories belongs to international teachers (ES = 0.55), followed by junior high school teachers (ES = 0.39), high school teachers (ES = 0.32), lecturers (ES = 0.30), and elementary school teacher (ES = 0.16). The difference test results show five significant different (Q<sub>between</sub> = 31.70 and P = 0.000 < 0.05).

The transformational leadership effects on innovative behavior in international teachers fall into strong categories (Mukaka, 2012). International schools have professional teachers (Hafids et al., 2020). They are required to consistently innovate to increase competitiveness with other educational institutions on a global level. The quality demands that the transformational leadership influence on innovative behavior is more substantial in international school teachers than that in elementary, junior high school, senior high school, or lecturers. Meanwhile, the lowest measure of the effect is found in the elementary school teachers. The transformational leadership among them does not necessarily improve teachers' innovative behavior. Upon practicing the transformational leadership, the principals need to increase teacher motivation as an intervening variable in developing teachers' innovative behaviors (Monoyasa et al., 2017).

Transformational leadership has become a key factor in improving the competitiveness of international schools, especially in shaping teachers' innovative behavior. In the context of economics and business education, innovation implemented by teaching staff has a major impact on the effectiveness of learning and students' readiness to face the global workforce. Hansen and Pihl-Thingvad (2019) found that teachers working under transformational leadership are more likely to develop technology-based learning methods, business simulations, and project-based approaches that are relevant to the industrial world. This shows that the role of the principal is not only as an administrator, but also as a leader who inspires teachers to continue to adapt to changes and the needs of the global labor market (Hansen & Pihl-Thingvad, 2019).

The implications of transformational leadership in economics and business education are not only limited to increasing teaching creativity, but also creating an innovative and collaborative academic environment. Purwanto et al. (2021) emphasized that international schools led by a transformational approach are better able to encourage collaboration between teachers, students, and industry, thereby creating a more applicable learning ecosystem. For example, the implementation of industry-based and entrepreneurship-based curricula can be more effective if supported by leadership that motivates teachers to innovate in teaching methods, such as using real-world case studies or digital-based business models (Purwanto et al., 2021). Thus, economics and business education based on transformational leadership will be better able to produce graduates who are ready to face global challenges.

However, not all levels of education respond to transformational leadership with equal effectiveness. Mokhber et al. (2018) highlighted that teachers in primary schools are less likely to be motivated to innovate compared to teachers in secondary or international schools. In the context of economics and business education, this indicates the need for differentiation of leadership strategies to accommodate the level of readiness and complexity of learning at each level of education. For example, in primary schools, innovation in teaching economics may be more effective through educational game-based methods, while in secondary schools and tertiary institutions, business simulations and market analysis may be more emphasized. Therefore, principals and educational stakeholders need to adjust their approaches to ensure that transformational leadership delivers optimal impact (Mokhber et al., 2018).

Teacher motivation as an intervening variable plays an important role in linking transformational leadership with innovation in economics and business education. Afsar & Umrani (2020) emphasized that a supportive work environment and motivational encouragement from the principal can increase teacher engagement in creating more interactive and relevant learning methods for the modern business world. For example, teachers who receive support to participate in entrepreneurship training or financial technology workshops will be more motivated to apply new concepts in their teaching. Thus, transformational leadership supported by the right incentive system will accelerate the innovation process in economics and business education, creating graduates who are more competitive and ready to face the dynamics of the global economy (Afsar & Umrani, 2020).

The findings on the influence of transformational leadership on teachers' innovative behavior have significant implications for economics and business education, especially in human resource management in educational institutions. In this context, principals or leaders of economics and business educational institutions can adopt the principles of transformational leadership to encourage innovation in teaching methods, curriculum, and technology-based learning strategies. By implementing this approach, educators in the fields of economics and business can be more adaptive to global changes and can develop relevant skills for students in facing the dynamics of the business world and industry. In addition, this study confirms that the influence of transformational leadership in improving teachers' innovative behavior is not always evenly distributed at all levels of education. This provides insight for economics and business educational institutions to adjust leadership strategies to the teaching staff's characteristics and students' needs. For example, in higher education in economics and business, innovation in teaching methods, such as case studies, business simulations, and big data, can be more effective if supported by leadership that encourages lecturers' motivation and creativity. Therefore, faculty or business school leaders need to design policies that are not only oriented toward improving academic quality but also prioritize the development of a culture of innovation among teaching staff.

Finally, this finding emphasizes the role of intervening variables in developing teachers' innovative behavior. In economics and business education, this shows that the success of innovation in teaching depends not only on leadership style but also on strategies to increase the motivation of teaching staff. Educational institutions can implement performance-based incentives, awards for innovation, and collaborative work environments to increase the motivation and creativity of teachers or lecturers. Thus, economics and business education can be increasingly relevant to the industry's needs and produce graduates ready to face the challenges of the global economy.

## CONCLUSIONS AND SUGGESTION

The current research aims to examine the effect size of transformational leadership on innovative behavior in the previous researches. 89% of related studies provide a significant effect size. The location of a square box on a forest plot which is not in line indicates a variation in results among the studies. In addition, the absence of publication showing the average effect rate of 0.338 represents a measure of the overall effect of studies on the influence of transformational leadership on the innovative behavior among teachers or lecturers. Meanwhile, the effect size heterogeneity

test results show that the estimation model used is a random effect model. Furthermore, the results of the analysis show that the largest average effect size of the five categories goes to the international teachers (ES = 0.55), followed by junior high school teachers (ES = 0.39), senior high school teachers (ES = 0.32), lecturers (ES = 0.30), and elementary school teachers (ES = 0.16).

This research pays attention to the role of transformational leaders in improving innovative work behavior in education, both in school and in higher education. The findings of this study show that transformational leadership can provide encouragement to the academic community to involve themselves in innovative work behaviors. Similarly, knowledge sharing shows the same thing where knowledge sharing shows a contribution in improving innovative work behavior. This study proves that the highest measure of the effect happens to the international teacher. It enriches the characteristics of knowledge in leadership. Practically, it can be a basis for policymakers that they can encourage the leaders in any institution to consistently implement the transformational leadership style to improve teachers' and lecturers' innovative behavior. This research only focuses the analysis only on the educational institutions in Indonesia. Further researches can examine the effect size for all categories, setting, subjects, and time.

Although this meta-analysis provides valuable insights into the effects of transformational leadership on innovative behavior, there are several limitations that need to be considered. First, the dominant research focus on teachers and lecturers tends to limit the scope of the findings, so the results may not necessarily apply to non-educational contexts. Second, the quality and availability of the primary studies analyzed greatly determine the validity of the aggregate effect sizes. Variations in research design, sample size, and measurement instruments across studies can reduce the generalizability of the findings. Third, this meta-analysis highlights the main effects but does not deeply examine moderator or mediator factors—such as organizational culture, resource availability, and individual characteristics—that likely influence the relationship between transformational leadership and innovative behavior.

Finally, many of the included studies are cross-sectional, making it difficult for researchers to draw causal conclusions regarding the role of transformational leadership in driving long-term innovation. To understand the more comprehensive mechanisms, future research should include other variables (e.g., organizational culture, management support, or employee engagement) to determine how transformational leadership can be optimized in driving innovation. Future research is expected to use a long-term design that can provide a clearer picture of the process of developing innovative behavior. This allows for a more in-depth analysis of the causal influence of transformational leadership over time. We also expect that further research will apply consistency of measurement instruments and analysis methods across studies, which is very necessary for stronger meta-analysis conclusions. In addition, the use of larger and more representative samples can increase external validity and strengthen the generalizability of research results. Cross-cultural studies will enrich the understanding of how cultural context influences the relationship between transformational leadership and innovative behavior. This approach can identify important similarities and differences that are relevant to global leadership practices

## REFERENCES

- Abbas, G., Iqbal, J., Waheed, A., & Riaz, M. N. (2012). Relationship between Transformational Leadership Style and Innovative Work Behavior in Educational Institutions. *Jornal of Behavioral Sciences*, 22(3), 37–39.
- Afsar, B., & Umrani, W. A. (2020). *Transformational leadership and innovative work behavior: The role of motivation to learn, task complexity, and innovation climate*. *European Journal of Innovation Management*, 23(2), 205-228.
- Akar, H. (2018). The relationships between quality of work life, school alienation, burnout, affective commitment and organizational citizenship: A study on teachers. *European Journal of Educational Research*. <https://doi.org/10.12973/eu-jer.7.2.169>.
- Al-Husseini, S., & Elbeltagi, I. (2016). Transformational leadership and innovation: a comparison study between Iraq's public and private higher education. *Studies in*

- Higher Education*, 41(1), 159–181. <https://doi.org/10.1080/03075079.2014.927848>.
- Ancok, D. (2012). *Psikologi Kepemimpinan dan Inovasi*. Jakarta: Erlangga.
- Aryee, S., Walumbwa, F. O., Zhou, Q., & Hartnell, C. A. (2012). Transformational Leadership, Innovative Behavior, and Task Performance: Test of Mediation and Moderation Processes. *Human Performance*. <https://doi.org/10.1080/08959285.2011.631648>.
- Baumann, P. K. (2011). The relationship between individual and organizational characteristics and nurse innovation behavior. *ProQuest Dissertations and Theses*.
- Boeckle, M., Kramer, U., & Clayton, N. S. (2024). *Memories for the future*. *Frontiers in Psychology*.
- Carmeli, A., Meitar, R., & Weisberg, J. (2006). Self-leadership skills and innovative behavior at work. *International Journal of Manpower*. <https://doi.org/10.1108/01437720610652853>.
- Cobanoglu, N. (2021). The Relationship between Shared Leadership, Employee Empowerment and Innovativeness in Primary Schools: A Structural Equation Modeling. *European Journal of Educational Research*, 10(1), 327-339.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education* (6th ed.). Routledge Falmer.
- De Jong, J. P. J., & Den Hartog, D. N. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*. <https://doi.org/10.1108/14601060710720546>.
- Elrehail, H., Emeagwali, O. L., Alsaad, A., & Alzghoul, A. (2018). The impact of Transformational and Authentic leadership on innovation in higher education: The contingent role of knowledge sharing. *Telematics and Informatics*, 35(1), 55–67. <https://doi.org/10.1016/j.tele.2017.09.018>
- Etikariena, A., & Muluk, H. (2014). Hubungan antara memori organisasi dan perilaku inovatif karyawan. *Makara Hubs-Asia*, 18(2), 77-88.
- Fayzhall, M., Asbari, M., Purwanto, A., Basuki, S., Hutagalung, D., Maesaroh, S., ... & Andriyani, Y. (2020). Pengaruh Gaya Kepemimpinan Terhadap Kapabilitas Inovasi Guru Dalam Perspektif Organizational Learning. *EduPsyCouns: Journal of Education, Psychology and Counseling*, 2(1), 64-91.
- Hafids, H., Sulfani, & Hidayat, A. (2020). Pengelolaan sumber daya manusia pada sekolah dengan kurikulum internasional: Studi komparasi di sekolah Pelita Harapan, Sekolah Tunas Muda, Dan Sekolah Tzu Chi. *Jurnal Bina Bangsa Ekonomika*, 13(01), 164–174.
- Haidich, A. B. (2010). Meta-analysis in medical research. *Hippokratia*, 14(Suppl 1), 29–37.
- Hansen, J. A., & Pihl-Thingvad, S. (2019). *Managing employee innovative behaviour through transformational and transactional leadership styles*. *Public Management Review*, 21(1), 1-23.
- Hidayat, A. S., & Rofaida, R. (2021). Peran kepemimpinan transformasional dan knowledge sharing dalam menstimulasi perilaku inovatif di institusi pendidikan. *Jurnal Ilmu Manajemen*, 9(2), 768-778.
- Hsiao, H. C., & Chang, J. C. (2011). The role of organizational learning in transformational leadership and organizational innovation. *Asia Pacific Education Review*, 12(4), 621–631. <https://doi.org/10.1007/s12564-011-9165-x>
- Hughes, L. W. (2006). Transparency, translucence or opacity? an experimental study of the impact of a leader's relational transparency and style of humor delivery on follower creative performance. *Dissertation Abstracts International Section A: Humanities and Social Sciences*.
- Jackson, D., & Turner, R. (2017). Power analysis for random-effects meta-analysis. *Research Synthesis Methods*, 8(3), 290–302. <https://doi.org/10.1002/jrsm.1240>

- De Jong, J. P., & Den Hartog, D. N. (2008). Innovative work behavior: Measurement and validation. *EIM Business and Policy Research*, 8(1), 1-27.
- Juandi, D., & Tamur, M. (2021). The impact of problem-based learning toward enhancing mathematical thinking: A meta-analysis study. *Journal of Engineering Science and Technology*, 16(4), 3548–3561.
- Kleysen, R. F., & Street, C. T. (2001). Toward a multi-dimensional measure of individual innovative behavior. *Journal of Intellectual Capital*, 2(3), 284-296.
- Kursunoglu, A., & Tanriogen, A. (2009). The relationship between teachers' perceptions towards instructional leadership behaviors of their principals and teachers' attitudes towards change. *Procedia-Social and Behavioral Sciences*, 1(1), 252-258.
- Mokhber, M., Khairuzzaman, W., & Vakilbashi, A. (2018). *Leadership and innovation: The moderator role of organization support for innovative behaviors*. *Journal of Management and Organization*, 24(1), 23-42.
- Monoyasa, M. W., Sularso, R. A., & Prihatini, D. (2017). Pengaruh gaya Kepemimpinan Transformasional Kepala Sekolah Terhadap Kinerja Guru Sekolah Dasar dengan Motivasi dan Inovasi Guru sebagai Variabel Intervening Di Kota Administratif Jember. *Relasi: Jurnal Ekonomi*, 13(2), 315-335.
- Mukaka, M. M. (2012). Statistics corner: A guide to appropriate use of correlation coefficient in medical research. *Malawi Medical Journal*, 24(3), 69–71.
- Northouse, P. (2012). *Leadership: Theory and Practice* (5th edition). In *Journal of Educational Administration*.
- Nuridin, F., Ihsan, M., Rahmawati, I., & Lestari, H. (2020). Pengaruh Kepemimpinan Transformasional dan Budaya Organisasi Terhadap Perilaku Kerja Inovatif Guru Di SMA Swasta Se-Kecamatan Pamijahan Bogor. *Indonesian Journal of Science*, 1(2), pp. 99–105).
- Østergaard, C. R., Timmermans, B., & Kristinsson, K. (2011). Does a different view create something new? The effect of employee diversity on innovation. *Research policy*, 40(3), 500-509.
- Pieterse, A. N., van Knippenberg, D., Schippers, M., & Stam, D. (2010). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. *Journal of Organizational Behavior*. <https://doi.org/10.1002/job.650>.
- Pigott, T. (2012). *Advances in meta-analysis*. Springer Science & Business Media.
- Purwanto, A., Purba, J. T., & Sijabat, R. (2021). *The role of transformational leadership, organizational citizenship behaviour, innovative work behaviour, quality work life, digital transformation and leader-member exchange in improving employee performance*. *Linguistica*, 5(2), 1-15.
- Putra, A. S., Waruwu, H., Asbari, M., Novitasari, D., & Purwanto, A. (2020). Leadership in the innovation era: Transactional or transformational style?. *International Journal of Social and Management Studies*, 1(1), 89-94.
- Putra, I. K. A. P., & Subudi, M. (2015). *Pengaruh Gaya Kepemimpinan Transformasional Dan Lingkungan Kerja Fisik Terhadap Kinerja Karyawan PT BPR Pedungan* (Doctoral dissertation, Udayana University).
- Robbins, S. P., & Judge, T. A. (2012). *Organizational behavior 15th edition*. Prentice Hall.
- Scott, S. G., & Bruce, R. A. (1994). Determinants of Innovative Behavior: A Path Model of Individual Innovation in the Workplace. *Academy of Management Journal*. <https://doi.org/10.5465/256701>.
- Suhana, S., Udin, U., Suharnomo, S., & Mas'ud, F. (2019). Transformational leadership and innovative behavior: The mediating role of knowledge sharing in Indonesian private university. *International Journal of Higher Education*, 8(6), 15–25. <https://doi.org/10.5430/ijhe.v8n6p15>.

- Sunardi, S., Sunaryo, W., & Laihad, G. H. (2019). Peningkatan Keinovatifan Melalui Pengembangan Kepemimpinan Transformasional Dan Efikasi Diri. *Jurnal Manajemen Pendidikan*, 7(1), 740–747. <https://doi.org/10.33751/jmp.v7i1.959>.
- Supriadi, O., Musthan, Z., Sa'odah, Nurjehan, R., Haryanti, Y. D., Rafid Marwal, M., Purwanto, A., Mufid, A., Yulianto, R. A., Farhan, M., Fitri, A. A., Fahlevi, M., & Sumartiningsih, S. (2020). Did transformational, transactional leadership style and organizational learning influence innovation capabilities of school teachers during covid-19 pandemic? *Systematic Reviews in Pharmacy*. <https://doi.org/10.31838/srp.2020.9.47>.
- Tjahjono, B., & Rosyid, A. (2019). Disruptive Innovation (Inovasi Mengganggu): Pengaruh Kepemimpinan Transformasional dan Budaya Organisasi. *Eduscience: Jurnal Ilmu Pendidikan*, 5(2), 73–82.
- Wang, P., & Rode, J. C. (2010). Transformational leadership and follower creativity: The moderating effects of identification with leader and organizational climate. *Human Relations*. <https://doi.org/10.1177/0018726709>.