Investigating the Impact of Transformational Leadership on Teachers' Pedagogical and Professional Competence: A Study of Vocational Teachers in Bandung and Its Influence on Student Achievements

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ABSTRACT

This research delves into the relationship between transformational leadership and students' achievements, specifically focusing on the impact of teachers' pedagogical and professional competencies among vocational teachers in Bandung. The main objective is to explore how these competencies mediate the effects of transformational leadership on students' performance. A survey method was employed, targeting a sample of 51 vocational teachers to gather comprehensive data. Utilizing PLS structural equation modeling, the study tested the proposed research model. Findings indicate that both teachers' pedagogical competence and professional competency serve as significant mediators, enhancing the link between transformational leadership and students' achievements. This indicates that effective leadership plays a crucial role in fostering an environment where teachers can excel in their pedagogical practices, ultimately benefiting student outcomes. The implications of these results underscore the importance of leadership development programs that not only focus on leadership skills but also prioritize the enhancement of teaching competencies among educators. This research contributes to the understanding of how leadership styles can be leveraged to improve educational outcomes in vocational settings.

Keywords: Transformational Leadership, Students' Achievements, Teachers' Pedagogical Competence, Teachers' Professional Competency, Vocational Education.

INTRODUCTION

The significance of examining teachers' pedagogical competence and professional competency in relation to student performance cannot be overstated. These competencies are fundamental pillars that directly influence how well students learn and engage in the educational process. When teachers excel in their pedagogical skills, they can effectively tailor lessons to meet the needs and interests of their students, fostering a more inclusive and stimulating learning environment. Strong professional competency ensures that teachers possess the necessary knowledge and skills to deliver high-quality instruction. This not only boosts students' understanding of the subject matter but also builds their confidence and motivation to learn. (Schmitz et al. 2023)

The relationship between these competencies and student performance allows educational institutions to prioritize teacher training and development programs. By investing in these areas, schools can enhance the overall quality of education, leading to improved academic outcomes for students. (Sidharta, 2020) Recognizing the pivotal role of teachers' competencies in shaping student success is essential for creating a thriving educational landscape that prepares students for future challenges. (Perera et al. 2017)

Exploring the impact of transformational leadership on teachers' pedagogical competence and professional competency is crucial in education. Transformational leadership encourages an environment where teachers are motivated to enhance their skills and adopt innovative teaching practices. Leaders who inspire their educators promote a culture of continuous improvement and professional growth, fostering an atmosphere where teachers feel empowered to develop their pedagogical effectiveness. (Alzoraiki et al. 2024; Sidharta, 2023) When transformational leaders prioritize the development of teachers' competencies, they create a ripple effect that positively influences student learning and engagement. Teachers who receive guidance and support from strong leaders are more likely to implement effective teaching strategies and remain committed to lifelong learning. This, in turn, leads to improved educational outcomes for students. (Niță and Guțu, 2023)

Moreover, understanding this relationship highlights the importance of leadership development programs in schools. By equipping leaders with the skills to inspire and mentor teachers, educational institutions can cultivate a

more competent and dedicated teaching workforce. Ultimately, recognizing the essential role of transformational leadership in enhancing teachers' competencies is vital for creating a successful educational environment that prioritizes student success. (Heru Siswanto, Hasan, Sowiyah & Ridwan, 2020).

Understanding how teachers' pedagogical and professional competencies mediate the impact of transformational leadership on student performance is crucial in education. (Gunawan & Adha, 2021). These competencies directly influence how effectively teachers engage and inspire their students. When teachers possess strong pedagogical skills, they are better equipped to create dynamic learning environments that cater to diverse learning styles and needs. Similarly, professional competencies ensure that teachers are knowledgeable, maintain high standards, and stay updated on best practices. (Purwanto, 2020)

By examining this mediation effect, we can identify specific areas where transformational leadership can enhance teaching practices. This insight allows educational leaders to implement strategies that nurture both teacher development and student achievement. Furthermore, focusing on these competencies fosters a culture of continuous improvement and professional growth among educators, ultimately leading to better educational outcomes. In essence, this inquiry not only highlights the importance of effective

leadership but also emphasizes the need for targeted teacher training that aligns with the demands of modern education, paving the way for future success in student learning experiences.

The central issue revolves around the impact of transformational leadership on teachers' pedagogical and professional competencies. It is essential to investigate how this style of leadership influences teachers to enhance their instructional methods and professional skills. Furthermore, a significant relationship exists between teachers' pedagogical competence and students' achievements, prompting a closer look at how effective teaching strategies contribute to better learning outcomes. Additionally, the role of teachers' professional competency must not be overlooked, as it also plays a crucial part in determining students' academic success.

As these factors interconnect, it is equally important to explore the combined effect of both teachers' pedagogical and professional competencies on students' achievements. Understanding these dynamics can provide valuable insights into how leadership practices in educational settings can drive improvements in teaching effectiveness and ultimately enhance student performance. Addressing these questions will shed light on the vital links between leadership, teacher development, and student outcomes, paving the way for more effective educational practices.

METHOD

To predict the proposed research model concerning the influence of transformational leadership on teachers' pedagogical and professional competencies, as well as its implications for students' achievements, the study utilized a survey approach. This survey targeted permanent vocational schoolteachers in Bandung City, employing a purposive sampling technique to involve those who were willing to participate.

The researchers distributed a questionnaire designed systematically, resulting in responses from 51 permanent teachers from vocational schools in Bandung. The questionnaire included five statements to measure transformational leadership, five to assess pedagogical competence, six statements for professional competency, and three statements to evaluate students' achievements.

Data quality was tested using outer loading values and reliability measures, followed by structural model testing based on the applicable model fit criteria. For the prediction analysis, the researchers referred to the methodology outlined by Hair, Risher, Sarstedt, and Ringle (2019), employing bootstrapping methods to ensure robust results. By carefully analyzing these aspects, the research aims to provide insights into how leadership styles can significantly enhance both teacher effectiveness and student outcomes in vocational education settings.

RESULTS and DISCUSSION

Before proceeding with further data analysis, researchers undertake several crucial steps to ensure data quality. The first step involves evaluating the outer loading values of the measurement model. This assessment helps determine how well each indicator represents its corresponding latent variable, ensuring that the variables are accurately measured.

Subsequently, researchers examine the reliability of the data. This involves checking internal consistency to confirm that the items within each construct produce stable and consistent results across different samples. By ensuring both the outer loading values and the reliability are satisfactory, researchers establish a solid foundation for the subsequent analysis. These preliminary checks are essential for validating the data and ensuring that any findings derived from the analysis are credible and meaningful.

Table 1. The Outer loading, VIF, Construct Reliability Test

	Transfo rmation al	Peda gogic al	Profe ssion al	Achie vemen ts	VI F
Tr L 1	0.689				1. 39 8

Item					VIF
TrL2	0.691				1.366
TrL3	0.815				3.516
TrL4	0.755				3.137
TrL5	0.712				1.528
Pec1		0.777			2.683
Pec2		0.538			1.186
Pec3		0.760			1.504
Pec4		0.711			2.545
Pec5		0.773			1.585
Prc1			0.612		1.433
Prc2			0.715		3.013
Prc3			0.661		2.998
Prc4			0.851		3.859
Prc5			0.823		3.763
Prc6			0.637		1.388
Sa1				0.851	1.532
Sa2				0.600	1.090
Sa3				0.801	1.472

Reliability Value

Construct	Cronbach's alpha	Composite reliability	AVE
Pedagogical Competence	0.758	0.839	0.515
Professional Competency	0.811	0.866	0.522
Students' Achievements	0.618	0.799	0.575
Transformational Leadership	0.784	0.853	0.539

The outer loading values for the research instruments, which include five statements measuring transformational leadership, five for pedagogical competence, six for professional competency, and three for students' achievements, presented in Table 1, indicate satisfactory results ranging from 0.538 to 0.851. Additionally, the Variance Inflation Factor (VIF)

values, ranging from 1.090 to 3.859, demonstrate no signs of multicollinearity among the constructs.

Furthermore, the reliability analysis revealed Cronbach's alpha values between 0.618 and 0.811, along with composite reliability scores ranging from 0.799 to 0.866. These reliability coefficients suggest that the instruments possess adequate internal consistency. Finally, the Average Variance Extracted (AVE) values, falling between 0.515 and 0.575, further support the reliability of the constructs. Collectively, these metrics affirm that the instruments used in this study are reliable and valid for measuring the intended variables.

Table 2. Discriminant Validity and Heterotrait-Monotrait Ratio Value

	Pedagogical	Professional	Achievements	Transformational
Pedagogical	0.718			
Professional	0.560	0.722		
Achievements	0.642	0.589	0.758	
Transformational	0.532	0.564	0.363	0.734
Heterotrait-monotrait ratio				HTMT Ratio
Professional Competency <-> Pedagogical Competence				0.726
Students' Achievements <-> Pedagogical Competence				0.899
Students' Achievements <-> Professional Competency				0.834
Transformational Leadership <-> Pedagogical Competence				0.678
Transformational Leadership <-> Professional Competency				0.703
Transformational Leadership <-> Students' Achievements				0.512

The evaluation of the research constructs is based on the analysis of the square root of the Average Variance Extracted (AVE), which was compared across the different variables in the study. The results indicated a strong discriminant validity among the constructs, as the square root of the AVE values surpassed the correlations between the variables as shown in table 2. Additionally, the Heterotrait-Monotrait (HTMT) ratio yielded values below 0.9, further confirming that there is no significant multicollinearity issue present among the constructs. These findings collectively suggest that the measurement model is well-structured, indicating that the constructs are distinct and appropriately measured.

Table 3. Path Coefficients, f-square, T statistics, P values and Model fit

	Coefficients	f-square	T statistics	P values	Decision
Pedagogical Competence ->	0.455	0.278	2.916	0.004	Accept

Students' Achievements					
Professional Competency -> Students' Achievements	0.335	0.150	2.088	0.037	Accept
Transformational Leadership -> Pedagogical Competence	0.532	0.395	4.722	0.000	Accept
Transformational Leadership -> Professional Competency	0.564	0.466	5.087	0.000	Accept
Transformational Leaders hip	0.431		5.251	0.000	Accept

	R-square	R-square adjusted	Q²predict	RMSE	MAE
hip -> Students' Achievements					
Pedagogical Competence	0.283	0.269	0.208	0.918	0.697
Professional Competency	0.318	0.304	0.260	0.893	0.677
Students' Achievements	0.489	0.468	0.084	0.993	0.793

The results of the structural model analysis indicate that the proposed predictions by the researchers are statistically significant, with significance values ranging from 0.000 to 0.037. This suggests a strong relationship between the variables in the study. The structural model itself demonstrates robust characteristics, highlighted by a moderate R-square value, which reflects the

model's explanatory power in accounting for variance among the dependent variables.

The positive Q²predict values indicate that the model has predictive relevance. The Root Mean Square Error (RMSE) values range from 0.893 to 0.993, while the Mean Absolute Error (MAE) values fall between 0.677 and 0.793, as shown in Table 3. These metrics suggest that the model has shown good fit and accuracy. A detailed explanation of the constructed structural model is provided in Figure 1, which illustrates the relationships among transformational leadership, teachers' competencies, and students' achievements visually, further supporting the study's findings.
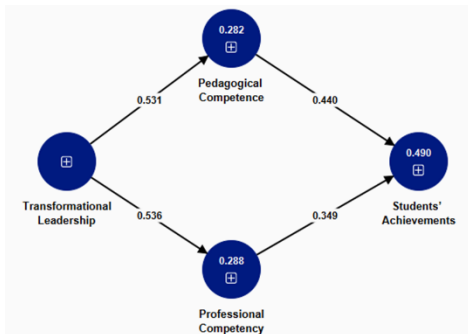

Figure 1. The Structural Model Result

Transformational leadership has been recognized as a powerful force in enhancing teachers' pedagogical and professional competencies. In the study by Schmitz et al. (2023), the researchers evaluate how transformational leadership facilitates the integration of technology in schools. They argue that effective leaders not only encourage the adoption of technology but also inspire teachers to embrace innovative practices. This empowerment leads teachers to become more adept at using technology in meaningful ways, thus improving their pedagogical competence. The study highlights that when leaders exhibit transformational qualities—such as vision, support, and recognition—they significantly influence teachers' willingness to experiment with new teaching methods that incorporate technology.

Carrington et al. (2024) delve into the implications of transformational leadership on inclusive educational practices. Their research demonstrates that leaders who adopt a transformational style can cultivate an environment that promotes diversity and equity. By fostering collaboration and trust, these leaders encourage teachers to develop their competencies in creating inclusive curricula and practices. As teachers feel supported and valued, they become more capable of addressing the varied needs of their students, thereby enhancing both their professional competency and pedagogical effectiveness.

Wang et al. (2024) examine the latent relationships between transformational leadership and teacher autonomy. Their findings reveal that transformational leaders promote a sense of agency among teachers, allowing them to take ownership of their teaching practices. This autonomy not only boosts teachers' confidence

but also enables them to refine their pedagogical approaches based on individual student needs. As a result, teachers are likely to become more innovative and effective in their instructional methods, leading to improved outcomes for their students. By cultivating an empowering and supportive environment, transformational leaders can drive significant improvements in teaching practices, ultimately benefiting student learning experiences.

The influence of teachers' pedagogical competence on students' achievements is a critical area of research, supported by various studies. In the work of Puja (2024), the author investigates how teachers' pedagogical competence affects student learning satisfaction, particularly in the context of online learning. The study reveals that effective teaching strategies lead to higher levels of online learning motivation, which in turn enhances students' overall learning satisfaction. This connection emphasizes that when teachers possess strong pedagogical skills, they can create engaging learning environments that motivate students, ultimately contributing to improved academic performance.

Rubeba (2023) further underscores the importance of instructional competencies in the teaching and learning processes within higher education. The research highlights that teachers who demonstrate effective instructional competencies are better equipped to facilitate learning, adapt to diverse student needs, and

employ various teaching methodologies. By doing so, they can significantly enhance students' understanding and retention of knowledge. The findings indicate that improving teaching competencies among educators is essential for fostering better educational outcomes for students, showcasing a direct link between pedagogical competence and student achievement.

The quality of teaching and the skills teachers employ in their instruction directly impact student success. Enhanced pedagogical competence leads to more effective teaching practices, which not only engage students but also promote deeper learning, ultimately resulting in higher academic achievements. This highlights the necessity of investing in teacher training and professional development to bolster pedagogical skills, as such efforts can translate into significant improvements in student outcomes.

The influence of teachers' professional competency on students' achievements is well-documented in educational research. In the study by Al-Nimer and Alsheikh (2022), the authors explore the role of e-learning in enhancing student engagement and the relationship between accounting professional competencies and academic success. Their findings suggest that when teachers possess strong professional competencies—especially in utilizing digital tools for instruction—they can effectively engage students in the learning process. This heightened

engagement contributes to better academic performance, illustrating that the quality of a teacher's professional skills directly impacts student outcomes.

Perera et al. (2017) delve into the complexities of professional competencies in higher education, emphasizing the ongoing tensions between education and training. Their analysis highlights that teachers who are well-versed in their professional field and educational practices can bridge gaps in student skills and knowledge. By aligning their teaching with industry standards and expectations, these educators prepare students for real-world challenges, thereby improving student achievements. The study underscores the necessity of continuous professional development for educators to refine their competencies and enhance the learning experiences they provide.

Moreover, research by Superi and Naqshbandi (2022) examines the impact of lecturer competencies on student academic performance, focusing on the moderating role of student motivation. Their findings indicate that teachers with high levels of professional competency foster a learning environment that boosts student motivation, which in turn enhances academic performance. This suggests that teachers' professional skills not only contribute to effective instruction but also play a crucial role in

motivating students to achieve their academic goals.

Educators who continuously refine their professional skills and remain adaptable are better equipped to engage students, provide relevant knowledge, and foster an environment conducive to high academic performance. Investing in teachers' professional development is essential for enhancing educational outcomes and preparing students for future challenges.

The relationship between teachers' pedagogical competence, professional competency, and students' achievements is a crucial area of study in education. Alzoraiki et al. (2024) investigate the role of transformational leadership in enhancing both school culture and teaching performance in Yemeni public schools. Their findings illustrate that effective leadership promotes a positive school environment where teachers are supported in developing their pedagogical and professional competencies. This supportive atmosphere not only enhances teachers' skills but also translates into improved student performance, emphasizing the interconnectedness of these factors.

In the study by Niță and Guțu (2023), the authors explore how leadership and digital transformation impact student work engagement in higher education. They highlight that when educators possess a strong foundation in both pedagogical and professional competencies—especially in integrating technology into their

teaching—students are more likely to engage actively in their learning processes. This active engagement fosters better academic outcomes, showing that the competencies of teachers play a significant role in elevating students' achievements.

Sidharta (2024) extends this discussion by exploring resilience as a key competence that affects overall performance in the workplace, including educational contexts. Resilience, combined with strong pedagogical and professional skills, enables teachers to adapt to challenges and maintain high teaching standards, ultimately benefiting students' academic success.

Thao et al. (2022) discuss teachers' competencies in the context of education for sustainable development in Vietnam. The study illustrates how teachers equipped with deep pedagogical knowledge and professional skills can instill values of sustainability in their students, leading to greater awareness and engagement in relevant academic topics. This connection reinforces the idea that teachers' dual competencies not only enhance students' curricular knowledge but also promote holistic development, enhancing achievement both inside and outside of the classroom. The importance of continuous development for educators, as cultivating these competencies is essential for fostering student success in a rapidly changing educational landscape.

CONCLUSION

The research results clearly demonstrate that transformational leadership significantly enhances both teachers' pedagogical and professional competencies, which in turn fosters improved student achievements. This connection underscores the importance of effective leadership in shaping a supportive and dynamic learning environment. When school leaders adopt transformational practices, they inspire teachers to continuously develop their skills and adopt innovative teaching strategies. This proactive approach not only uplifts the educators but also significantly benefits students by providing them with a more engaging and effective learning experience.

The implications of these findings are substantial for educational policy and practice. Schools should invest in leadership training programs that focus on developing transformational leadership qualities among administrators. Such initiatives can promote a culture of collaboration and innovation within schools, ensuring that teachers feel supported and motivated to enhance their competencies. As a result, schools can create an educational landscape that prioritizes both teacher development and student success.

Nevertheless, this study has several limitations that must be acknowledged. The use of a survey methodology, while useful, restricts

the depth of understanding that can be achieved regarding the complex interplay between leadership, teaching competencies, and student outcomes. Moreover, the small sample size and localized focus narrow the applicability of the findings, potentially limiting their relevance to broader educational contexts.

To address these limitations, future research should seek to involve a larger, more diverse sample across different educational settings. This would enable a comprehensive exploration of the factors influencing the relationship between transformational leadership and teacher competencies. Additionally, employing qualitative methods, such as interviews or case studies, could provide richer insights into the lived experiences of teachers and leaders. Longitudinal studies would also be beneficial to track how these dynamics develop over time and their sustained impact on student achievements.

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