



THE INFLUENCE OF TEACHER INNOVATION THROUGH STRENGTHENING PROACTIVE PERSONALITY, KNOWLEDGE SHARING, AND CREATIVE SELF-EFFICACY

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Abstract

This study aims to examine the direct and indirect effects of proactive personality (X1), knowledge sharing (X2), and creative self-efficacy (X3) on teacher innovation (Y) among vocational high school (SMK) teachers in Depok City, Indonesia. A quantitative approach was employed using path analysis with Partial Least Squares Structural Equation Modeling (PLS-SEM). Data were collected from 158 civil servant teachers across four public vocational high schools in Depok City using validated questionnaires. The study tested nine hypotheses examining both direct and indirect relationships. The results revealed that proactive personality ($\beta = 0.212$, $p < 0.001$), knowledge sharing ($\beta = 0.229$, $p < 0.001$), and creative self-efficacy ($\beta = 0.205$, $p < 0.01$) have significant positive direct effects on teacher innovation. Additionally, knowledge sharing and creative self-efficacy partially mediated the relationship between proactive personality and teacher innovation. The model explained 43.2% of the variance in teacher innovation. This study contributes to the educational management literature by empirically demonstrating the mediating mechanisms through which proactive personality influences teacher innovation. The findings provide practical implications for strengthening teacher innovation in vocational education contexts.

Keywords: Teacher innovation, proactive personality, knowledge sharing, creative self-efficacy, vocational education

INTRODUCTION

Vocational secondary education (SMK) occupies a strategic position in preparing human resources with competencies aligned with the demands of the business, industrial, and employment sectors. Unlike general education, which emphasizes academic mastery, vocational education prioritizes competency development, work skills, and labor-market readiness. Rapid technological changes, digital transformation across various industrial sectors, and the emergence of new occupational categories require SMK to continuously enhance the quality of educational delivery to produce graduates who are adaptive, productive, and competitive. According to UNESCO (2023), vocational education must transform toward flexible, technology-based learning capable of responding to evolving future skill requirements (UNESCO, 2023). Consequently, improving the quality of vocational education has become a critical agenda in educational development and human resource capacity building.

In the context of vocational education, teachers constitute the primary determinant of learning quality and student competency achievement. Teachers bear responsibility not only for delivering instructional materials but also for serving as facilitators, mentors, curriculum developers, and agents of change who bridge industry needs with school-based learning processes. This role has become increasingly complex with the proliferation of digital technology, artificial intelligence, automation,

the Internet of Things, and other industrial innovations. The Organisation for Economic Co-operation and Development (2024) emphasizes that 21st-century teachers must possess the capacity to design adaptive learning experiences, leverage technology effectively, and cultivate learning environments that foster creativity, problem-solving, and collaboration (OECD, 2024). This reality underscores that the quality of vocational education is substantially influenced by teachers' capacity to adapt to changes in the educational landscape and the world of work.

Despite the critical importance of teacher innovation, a preliminary survey of 30 SMK teachers in Depok City found that 31–36% have not achieved the expected level of innovation. Specifically, 35% of teachers demonstrated suboptimal capacity in generating new learning ideas, 33% showed suboptimal ability in developing creative teaching methods, 34% exhibited suboptimal capacity in developing innovative learning media, 36% demonstrated suboptimal ability in utilizing technology in learning, 31% showed suboptimal capacity in implementing new ideas in learning, and 33% exhibited suboptimal behavior in sharing innovative learning practices with colleagues. These findings indicate that the capacity to generate new ideas, develop methods and learning media, utilize technology, implement new ideas, and disseminate innovative practices still needs strengthening to improve the quality of learning sustainably.

Previous studies have examined various antecedents of teacher innovation. Ahmad et al. (2023) found that ethical leadership significantly influences followers' innovative work behavior through psychological safety and proactive personality (Ahmad et al., 2023). AlEssa (2022) conducted a systematic review demonstrating that innovative work behavior concepts have evolved with multiple contributing factors (AlEssa, 2022). Gkontelos et al. (2023) showed that teachers' innovative work behavior is significantly influenced by self-efficacy and burnout, with self-efficacy having a strong positive relationship (Gkontelos et al., 2023). Liu (2022) found that professional learning communities can promote teacher innovation through multilevel moderated mediation (Liu, 2022). Mubarak et al. (2021) demonstrated that proactive personality significantly impacts innovative work behavior through work engagement and transformational leadership (Mubarak et al., 2021). However, existing research has not comprehensively examined the mediating mechanisms through which proactive personality influences teacher innovation, particularly the simultaneous roles of knowledge sharing and creative self-efficacy in the vocational education context.

This study addresses the gap by investigating the direct and indirect effects of proactive personality, knowledge sharing, and creative self-efficacy on teacher innovation. Specifically, this research aims to: (1) examine the direct effects of proactive personality, knowledge sharing, and creative self-efficacy on teacher innovation; (2) investigate the mediating role of knowledge sharing and creative self-efficacy in the relationship between proactive personality and teacher innovation; and (3) identify strategies for strengthening teacher innovation through these variables.

Based on social cognitive theory (Bandura) and proactive motivation theory (Parker et al.), we hypothesize that proactive personality positively influences teacher innovation both directly and

indirectly through knowledge sharing and creative self-efficacy. Proactive individuals tend to seek opportunities, take initiative, and anticipate problems, which enhances their confidence in their creative abilities and encourages knowledge-sharing behaviors, ultimately leading to greater innovation in teaching practices. The following hypotheses were tested: (1) proactive personality has a positive direct effect on teacher innovation; (2) knowledge sharing has a positive direct effect on teacher innovation; (3) creative self-efficacy has a positive direct effect on teacher innovation; (4) proactive personality has a positive direct effect on knowledge sharing; (5) proactive personality has a positive direct effect on creative self-efficacy; (6) knowledge sharing mediates the relationship between proactive personality and teacher innovation; and (7) creative self-efficacy mediates the relationship between proactive personality and teacher innovation.

METHOD

Research Design and Participants

This study employed a quantitative, causal design with path analysis. The research was conducted at four public vocational high schools (SMK Negeri) in Depok City, West Java, Indonesia, from January to June 2025. The population consisted of 261 civil servant teachers. Using the Yamane formula with a 5% error margin, a sample of 158 teachers was selected through proportional random sampling. The sample distribution was as follows: SMK Negeri 1 (44 teachers), SMK Negeri 2 (50 teachers), SMK Negeri 3 (43 teachers), and SMK Negeri 4 (21 teachers).

Instruments

Five instruments were developed based on conceptual definitions and indicators derived from literature synthesis:

Teacher Innovation (Y) is measured by six indicators: (1) Idea Generation, (2) Creative Teaching Methods, (3) Innovative Learning Media Development, (4) Technology-Based Innovation, (5) Idea Implementation, and (6) Innovation Diffusion. The instrument consisted of 40 items using a Behavior Rating Scale (1 = Never to 5 = Always).

Proactive Personality (X1) is measured by six indicators: (1) Opportunity Seeking, (2) Initiative Taking, (3) Problem Anticipation, (4) Change Orientation, (5) Persistence, and (6) Future Orientation. The instrument consisted of 40 items using a Behavior Rating Scale.

Knowledge Sharing (X2) is measured by five indicators: (1) Knowledge Donating, (2) Experience Sharing, (3) Knowledge Contribution, (4) Knowledge Collecting, and (5) Collaborative Knowledge Exchange. The instrument consisted of 40 items using a Behavior Rating Scale.

Creative Self-Efficacy (X3) is measured by five indicators: (1) Creative Confidence, (2) Idea Development Confidence, (3) Creative Problem Solving, (4) Innovation Implementation Confidence, and (5) Creative Achievement. The instrument consisted of 40 items using a Likert Scale (1 = Strongly Disagree to 5 = Strongly Agree).

All instruments were validated through pilot testing with 30 respondents. Item validity was assessed using the product-moment correlation. Reliability was assessed using Cronbach's Alpha, with all instruments achieving $\alpha > 0.70$, indicating high reliability.

Data Analysis

Data analysis proceeded in two stages. First, descriptive statistics were calculated to provide an overview of the data distribution. Second, path analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 3.0. The analysis followed Hair et al.'s (2017) systematic procedure: (1) specifying the structural model, (2) specifying the measurement model, (3) collecting and examining data, (4) estimating the PLS path model, (5) assessing the reflective/formative measurement models, (6) assessing the structural model, (7) conducting advanced PLS-SEM analysis, and (8) interpreting results (Hair et al., 2017, p. 30).

The measurement model was evaluated using convergent validity (loading factors > 0.7 , AVE > 0.5), discriminant validity (Fornell-Larcker criterion), and composite reliability (CR > 0.7). The structural model was assessed using R^2 , effect size (f^2), predictive relevance (Q^2), and significance testing through bootstrapping with 5,000 resamples.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 presents the descriptive statistics for all variables. The mean scores ranged from 3.99 to 4.15 on a 5-point scale, indicating generally positive perceptions across all variables. Knowledge sharing had the highest mean (4.15), followed by creative self-efficacy (3.99) and proactive personality (4.02). Teacher innovation had a mean of 4.06.

Table 1. Descriptive Statistics of Research Variables

Variable	Mean	SD	Min	Max
Teacher Innovation (Y)	4.06	0.42	2.56	4.76
Proactive Personality (X1)	4.02	0.51	2.24	4.91
Knowledge Sharing (X2)	4.15	0.43	2.06	4.88
Creative Self-Efficacy (X3)	3.99	0.46	2.06	4.97

Measurement Model Evaluation

All indicators demonstrated satisfactory psychometric properties. Loading factors ranged from 0.719 to 0.916, exceeding the 0.7 threshold. Average Variance Extracted (AVE) values ranged from 0.601 to 0.791, exceeding 0.5. Composite Reliability (CR) values ranged from 0.900 to 0.950, exceeding the 0.7 threshold. The Fornell-Larcker criterion confirmed discriminant validity, with each construct's AVE square root exceeding its correlations with other constructs.

Structural Model Evaluation

The structural model assessment showed no multicollinearity issues, with all VIF values below 3.3. The model explained 43.2% of the variance in teacher innovation ($R^2 = 0.432$, adjusted $R^2 = 0.419$), indicating a moderate explanatory power. Predictive relevance was confirmed with Q^2 values > 0 for all endogenous variables (teacher innovation $Q^2 = 0.246$). The SRMR value of 0.063 indicated a good model fit.

Table 2. Direct Effects on Teacher Innovation

Path	Coefficient (β)	T-Statistics	P-Value	Decision
Proactive Personality (X1) $\rightarrow$ Teacher Innovation (Y)	0.212	3.747	0.000	Supported
Knowledge Sharing (X2) $\rightarrow$ Teacher Innovation (Y)	0.229	3.533	0.000	Supported
Creative Self-Efficacy (X3) $\rightarrow$ Teacher Innovation (Y)	0.205	3.104	0.002	Supported

Table 3. Direct Effects on Mediating Variables

Path	Coefficient (β)	T-Statistics	P-Value	Decision
Proactive Personality (X1) $\rightarrow$ Knowledge Sharing (X2)	0.213	2.746	0.006	Supported
Proactive Personality (X1) $\rightarrow$ Creative Self-Efficacy (X3)	0.201	2.983	0.003	Supported

Table 4. Indirect Effects on Teacher Innovation

Path	Coefficient (β)	T-Statistics	P-Value	Decision
X1 $\rightarrow$ X2 $\rightarrow$ Y	0.049	2.191	0.029	Supported
X1 $\rightarrow$ X3 $\rightarrow$ Y	0.041	2.211	0.027	Supported

The results indicate that proactive personality, knowledge sharing, and creative self-efficacy all have significant positive direct effects on teacher innovation. Knowledge sharing had the strongest effect ($\beta = 0.229$), followed by proactive personality ($\beta = 0.212$) and creative self-efficacy ($\beta = 0.205$). Furthermore, both knowledge sharing and creative self-efficacy partially mediated the relationship between proactive personality and teacher innovation, as indicated by significant indirect effects and larger direct effects than the indirect effects.

Discussion

The findings of this study provide empirical evidence supporting the significant role of proactive personality, knowledge sharing, and creative self-efficacy in enhancing teacher innovation among vocational high school teachers. These results align with and extend previous research on

teacher innovative work behavior, offering both theoretical and practical contributions to the field of educational management.

The Direct Effect of Proactive Personality on Teacher Innovation

The study found a significant positive direct effect of proactive personality on teacher innovation ($\beta = 0.212$, $p < 0.001$). This finding is consistent with previous research demonstrating that teachers with proactive personalities are more likely to engage in innovative behaviors (Mubarak et al., 2021; Ahmad et al., 2023). Proactive individuals are characterized by their tendency to identify opportunities, take initiative, and create positive change in their work environment without waiting for external direction (Ahmad et al., 2023). In the educational context, teachers with a strong proactive personality are more likely to explore new ideas, develop creative teaching methods, and implement innovations in their teaching practices.

This finding extends the work of Ullah et al. (2024), who found that proactive personality positively influences innovative work behavior in knowledge-intensive organizations (Ullah et al., 2024), and Mubarak et al. (2021), who demonstrated that proactive personality significantly affects employees' innovative work behavior through work engagement and transformational leadership (Mubarak et al., 2021). The present study confirms these findings in the Indonesian vocational education context, where teachers face unique challenges arising from rapid technological change and evolving industry demands.

The theoretical explanation for this relationship lies in proactive personality itself. Individuals with proactive personalities do not merely react to their environment; they actively shape it through anticipatory actions and change-oriented behaviors (Ahmad et al., 2023). In teaching, this translates into teachers who continuously seek opportunities for improvement, experiment with new pedagogical approaches, and persist in implementing innovative ideas despite obstacles. The “Persistence” indicator of proactive personality (mean = 4.06) and “Opportunity Seeking” (mean = 4.04) were particularly strong, suggesting that vocational teachers who persistently pursue their goals and actively seek opportunities for improvement are more likely to demonstrate innovative behavior.

The Direct Effect of Knowledge Sharing on Teacher Innovation

Knowledge sharing demonstrated the strongest direct effect on teacher innovation ($\beta = 0.229$, $p < 0.001$). This finding corroborates previous research showing that knowledge sharing is a critical mechanism for fostering innovation in educational settings (Akram, 2020; Kmiecik, 2021). The process of sharing knowledge, experiences, information, and best practices among teachers enables the cross-pollination of ideas, accelerates learning, and facilitates the development of innovative solutions to teaching challenges.

This result is consistent with Akram (2020), who found that knowledge sharing mediates the relationship between organizational justice and innovative work behavior (Akram, 2020), and

Kmiecik (2021), who demonstrated that knowledge sharing significantly influences innovative work behavior in organizational contexts (Kmiecik, 2021). The present study's finding that knowledge sharing has the strongest effect among the three variables underscores its critical importance in vocational education contexts.

All indicators of knowledge sharing in this study scored above 4.0, with “Experience Sharing” the highest (4.24), followed by “Collaborative Knowledge Exchange” (4.16), “Knowledge Donating” (4.15), and “Knowledge Contribution” (4.15). These high scores suggest that vocational teachers already engage in substantial knowledge-sharing activities, which likely contribute to their innovative behavior. The mechanism through which knowledge sharing promotes innovation is multifaceted. First, knowledge sharing provides teachers with access to diverse perspectives and approaches they might not have discovered on their own. Second, it facilitates collective problem-solving, enabling teachers to develop more comprehensive and creative solutions to pedagogical challenges. Third, it creates a culture of continuous learning and improvement that supports innovation (Kmiecik, 2021).

The Direct Effect of Creative Self-Efficacy on Teacher Innovation

Creative self-efficacy was found to have a significant positive direct effect on teacher innovation ($\beta = 0.205$, $p < 0.01$). This finding aligns with Bandura's social cognitive theory, which posits that individuals' beliefs in their capabilities influence their motivation, effort, and persistence in challenging tasks. Teachers with high creative self-efficacy are more confident in their ability to generate creative ideas, solve problems innovatively, and implement new approaches in their teaching.

This result supports previous research by Javed et al. (2021), who found that creative self-efficacy mediates the relationship between inclusive leadership and innovative work behavior (Javed et al., 2021), and Gelaidan et al. (2024), who demonstrated that creative self-efficacy moderates the relationship between servant leadership and innovative work behavior (Gelaidan et al., 2024). The present study extends these findings by demonstrating that creative self-efficacy directly influences teacher innovation in the Indonesian vocational education context.

The indicators of creative self-efficacy in this study showed that “Idea Development Confidence” (4.05) and “Creative Achievement” (4.01) were among the highest. In contrast, “Creative Confidence” (3.94) and “Creative Problem Solving” (3.93) were slightly lower but still above the midpoint. This pattern suggests that while vocational teachers are generally confident in their ability to develop ideas and achieve creative outcomes, there is room to strengthen their basic creative confidence and problem-solving skills.

The theoretical mechanism linking creative self-efficacy to innovation is well-established. Individuals with high creative self-efficacy are more likely to engage in creative activities, persist in the face of challenges, and view obstacles as opportunities for learning rather than threats (Javed et

al., 2021). In teaching, this translates to teachers who are willing to experiment with new methods, adapt their approaches based on feedback, and continuously seek ways to improve their practice.

The Mediating Role of Knowledge Sharing

The study found that knowledge sharing partially mediates the relationship between proactive personality and teacher innovation (indirect effect = 0.049, $p < 0.05$). This finding suggests that proactive teachers are more likely to engage in knowledge-sharing behaviors, which in turn enhance their innovative capabilities. The partial mediation indicates that, while proactive personality has a direct effect on innovation, part of its effect operates through knowledge sharing.

This result extends previous research on the relationship between proactive personality and knowledge sharing. Proactive individuals are naturally inclined to seek information, share their knowledge, and engage in collaborative problem-solving (Ahmad et al., 2023). In educational settings, proactive teachers are more likely to participate in professional learning communities, share their experiences and best practices, and actively seek knowledge from colleagues. These knowledge-sharing behaviors then provide the raw material for innovation by exposing teachers to new ideas, approaches, and solutions.

The partial nature of the mediation suggests that proactive personality also influences innovation through other mechanisms not captured in this model, such as direct experimentation or personal reflection. However, the significant indirect effect confirms that knowledge sharing is an important pathway through which proactive personality enhances teacher innovation (Akram, 2020).

The Mediating Role of Creative Self-Efficacy

Creative self-efficacy also partially mediated the relationship between proactive personality and teacher innovation (indirect effect = 0.041, $p < 0.05$). This finding indicates that proactive teachers are more likely to develop confidence in their creative abilities, which in turn enhances their innovative behavior. The partial mediation suggests that proactive personality affects innovation both directly and through creative self-efficacy.

This finding is consistent with previous research showing that proactive personality positively influences creative self-efficacy (Javed et al., 2021; Gelaidan et al., 2024). Proactive individuals tend to experience more success in initiating change and solving problems, which builds their confidence in their creative abilities (Javed et al., 2021). In teaching, proactive teachers who consistently seek out opportunities for improvement and successfully implement innovations develop stronger beliefs in their capacity to be creative and innovative.

The theoretical explanation for this relationship draws on Bandura's concept of mastery experiences as a source of self-efficacy. Proactive teachers who take initiative and successfully implement changes accumulate positive experiences, thereby enhancing their creative self-efficacy.

This enhanced self-efficacy then motivates further innovative behavior, creating a positive cycle of proactive action, successful innovation, and increased confidence (Gelaidan et al., 2024).

Theoretical Contributions

This study makes several theoretical contributions to the literature on teacher innovation. First, it extends the application of social cognitive theory to the vocational education context by demonstrating how proactive personality, knowledge sharing, and creative self-efficacy interact to influence teacher innovation. The findings support Bandura's assertion that personal factors (proactive personality, creative self-efficacy) and behavioral factors (knowledge sharing) interact to influence outcomes.

Second, the study contributes to the understanding of proactive motivation theory by demonstrating that proactive personality influences innovation through multiple pathways. The partial mediation by both knowledge sharing and creative self-efficacy suggests that proactive individuals leverage both social (knowledge sharing) and psychological (creative self-efficacy) mechanisms to enhance their innovation.

Third, the study addresses the gap in the literature regarding the specific mechanisms through which proactive personality influences teacher innovation in vocational education. Previous research has largely focused on direct effects or single mediator models. This study provides a more comprehensive understanding by examining two parallel mediating pathways simultaneously (Ahmad et al., 2023; Mubarak et al., 2021).

Practical Implications

The findings have several practical implications for strengthening teacher innovation in vocational education. First, given the significant effect of proactive personality on innovation, school leaders should consider proactive personality as a criterion in teacher selection and development programs. Recruitment processes could include assessments of proactivity, and professional development programs could include components designed to enhance teachers' proactive Orientation (Mubarak et al., 2021).

Second, the strong effect of knowledge sharing on innovation suggests that schools should actively foster cultures of knowledge sharing. It could be achieved by establishing professional learning communities, creating formal and informal opportunities for teachers to share their experiences and best practices, and recognizing and rewarding knowledge-sharing behaviors. The high scores on knowledge sharing indicators suggest that vocational teachers are already engaging in these behaviors, but there is still room for improvement (Akram, 2020, p. 1; Kmiecik, 2021).

Third, the significant effect of creative self-efficacy on innovation indicates that schools should invest in building teachers' confidence in their creative abilities. It could be achieved through

providing opportunities for teachers to experiment with new approaches, offering constructive feedback on their innovations, and celebrating creative achievements. The slightly lower scores on creative confidence and creative problem solving suggest these are areas particularly in need of attention (Javed et al., 2021; Gelaidan et al., 2024).

Fourth, the mediating roles of knowledge sharing and creative self-efficacy suggest that interventions to enhance teacher innovation should address both mechanisms simultaneously. Programs that focus solely on building a proactive personality or on enhancing creative self-efficacy may be less effective than comprehensive approaches that address all three variables.

Limitations and Future Research

Several limitations of this study should be acknowledged. First, the cross-sectional design limits causal inference. While the theoretical model suggests directional relationships, longitudinal studies are needed to establish causal ordering. Second, the study relied on self-report measures, which may be subject to social desirability bias and common-method bias. Future research could incorporate objective measures of teacher innovation or peer evaluations.

Third, the study was conducted in a specific context (public vocational high schools in Depok City, Indonesia), which may limit generalizability to other educational levels or cultural contexts. Future research could examine whether these findings replicate in different settings, such as general high schools, private schools, or other countries.

Fourth, the model explained 43.2% of the variance in teacher innovation, suggesting that other variables not included in this study also influence it. Future research could examine additional antecedents, such as organizational support, leadership styles, or school culture, and their interactions with proactive personality, knowledge sharing, and creative self-efficacy.

CONCLUSION

This study examined the influence of proactive personality (X1), knowledge sharing (X2), and creative self-efficacy (X3) on teacher innovation (Y) among vocational high school teachers. The findings demonstrate that all three variables have significant positive direct effects on teacher innovation, with knowledge sharing having the strongest effect. Furthermore, knowledge sharing and creative self-efficacy partially mediate the relationship between proactive personality and teacher innovation.

These findings contribute to the theoretical understanding of teacher innovation by elucidating the mechanisms through which proactive personality influences innovative behavior. The practical implications suggest that strengthening teacher innovation requires a comprehensive approach that simultaneously addresses proactive personality development, a culture of knowledge sharing, and the enhancement of creative self-efficacy.

Limitations of this study include the cross-sectional design, reliance on self-report measures, and the specific context of public vocational high schools in one Indonesian city. These limitations suggest that the findings should be interpreted with caution and that future research should employ longitudinal designs, incorporate objective measures, and examine diverse educational contexts.

Recommendations for future research include: (1) conducting longitudinal studies to establish causal relationships; (2) examining the moderating effects of organizational factors on the relationships identified; (3) investigating whether these findings replicate in different educational levels and cultural contexts; and (4) exploring additional mediating and moderating variables that may influence the relationship between proactive personality and teacher innovation.

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