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Predictor factors for teacher innovative behavior during curriculum reform: The role of cognitive flexibility, positive affect, and negative affect

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ABSTRACT

Teacher innovative behavior is one of the key capabilities for maximizing teacher performance as well as the student learning process, especially when teachers face new changes in their education system such as curriculum reform. However, insufficient attention has been given to understanding the interaction of predictor factors to encourage teacher innovative behavior. This study aims to assess the role of cognitive flexibility, positive affect, and negative affect in predicting teacher innovative behavior. A cross-sectional and quantitative design was used for this study. The data collection procedure used convenience sampling, with questionnaires distributed online via social media through several teacher communities. Three instruments were used: the Teacher Innovative Behavior Scale, the Cognitive Flexibility Inventory, and the Positive Affect and Negative Affect Schedule. Data were collected from 322 teachers from three educational levels. Descriptive analysis, correlation analysis, and hierarchical multiple regression analysis were conducted. The result showed that cognitive flexibility and positive affect positively predict teacher innovative behavior. On the other hand, negative affect negatively predicts teachers' innovative behavior. Regarding the model, the result indicates that cognitive flexibility plays a more crucial role in predicting teacher innovative behavior, explaining 28.1% of the variance in the model. Researchers and policymakers could use the outcome to create future research, policies, and programs to enhance the capabilities of teachers to perform innovative behavior, especially during the educational system's changes.

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INTRODUCTION

Innovation is regarded as a critical factor for the sustainability and success of organizations (Baskaran & Rajarathinam, 2018; Hashim et al., 2019; Kwon & Kim, 2020). In the face of today's challenges, innovation plays a vital role in maintaining a competitive edge not only for the organization but also for the nation, communities, and individuals. While innovation is commonly associated with specific sectors such as business and technology (Asurakkody & Shin, 2018; Leong & Rasli, 2014), it is equally imperative in critical areas like the educational system to ensure effectiveness and competitive advantage. Specifically, in the 21st-century context, innovation is needed to help education keep pace with the advent of the rapidly growing industrial revolution (Kundu & Roy, 2016; Serdyukov, 2017; Zainal & Matore, 2019).

Specifically in Indonesia, one of the main efforts made is the implementation of a new curriculum at all levels of education called *Kurikulum Merdeka*. This curriculum was implemented for students and teachers to develop varied, dynamic, and effective learning (Ananiadou & Claro, 2009; Geisinger, 2016; Ministry of Education, Culture, Research, and Technology, 2023; Varas et al., 2023). Different learning and assessment methods represent the goal of *Kurikulum Merdeka*.

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Compared to the two previous curricula, namely Curriculum 2006 (KTSP) and Curriculum 2013 (K-13), *Kurikulum Merdeka* emphasizes active independent learning by students. Although K-13 has already emphasized the importance of skill assessment, *Kurikulum Merdeka* provides students with more opportunities to acquire these skills through varied learning experiences, both inside and outside the classroom. Assessments are not only conducted through written exams but also through project assessments. Additionally, compared to KTSP and K-13, *Kurikulum Merdeka* also emphasizes school assessments, not just individual students.

Even though *Kurikulum Merdeka* provides many new benefits in the education system, this new curriculum places new demands on teachers. For example, changes in curriculum, classroom management, priority of target skills for the students, and even changes in competencies needed for qualified teachers (Ministry of Education, Culture, Research, and Technology, 2023). To meet the goals of *Kurikulum Merdeka*, one of the key elements to highlight is the innovative behavior of the individuals involved. Teachers, who are directly involved in the education system and developing students' quality, need to perform innovative behavior to maximize the achievement of the goals of the education system's reforms (Baskaran & Rajarathinam, 2018). Teachers need to introduce new approaches to teaching because of the considerable disparity between the methods emphasized in *Kurikulum Merdeka* compared to both KTSP and K-13. *Kurikulum Merdeka* underscores self-directed learning by students, thereby positioning teachers more as facilitators responsible for initiating, overseeing, and assessing learning. Teachers are no longer the sole source of information for students. They must devise learning strategies that encourage active participation from all students, ensuring equitable engagement. Moreover, teachers should explore alternative assessment methods beyond written tests. They should assign end-of-semester projects to students and establish assessment criteria for these projects. Throughout this process, teachers are expected to continuously monitor and evaluate the effectiveness of their methods, adjusting them as necessary. These activities represent competencies associated with innovative teaching practices. Moreover, the ongoing curriculum modifications leave room for potential changes in the future. Teachers need to remain constantly prepared for any such shifts. Therefore, the capacity to perform innovative behavior, as highlighted earlier, stands as a key gauge of teachers' readiness to face changes in the educational system.

According to Messmann and Mulder (2012), innovative work behavior refers to employees' contributions to all work activities to accomplish innovation development in their work environment. Innovative work behavior is a highly dynamic and context-bound construct (Zhou & Shalley, 2003). The dynamism of innovative work behavior arises from the complex interplay between employees' past and present work activities, influencing both the innovation progress and employees' professional growth. It is context-bound due to the influence of contextual factors on work actions and outcomes, with significance attributed solely to the specific work environment in which they occur. Assessing innovative work behavior necessitates considering the context in which work activities unfold (Janssen, 2005; Messmann & Mulder, 2012; Scott & Bruce, 1994). Thus, the concept of teacher innovative behavior was developed. Teacher innovative behavior refers to the same definition as innovative work behavior but specifically relates to the educational setting. Four tasks relate to teachers' innovative behavior: opportunity exploration, idea generation, idea promotion, and idea realization (Messmann & Mulder, 2012). Opportunity exploration refers to identifying and understanding the needs and issues in one's workplace that present a chance for improvement and change. To tackle the identified possibilities, idea generation involves generating and proposing concepts for novel, applicable, and potentially helpful products or procedures. Idea promotion includes promoting the concepts by persuading the social environment of the envisioned innovation and building a coalition of allies that take over responsibility and provide necessary information, resources, and support. Idea realization entails trying out concepts, developing an innovation's intellectual or physical prototype, assessing and refining its suitability, and organizing its strategic integration into organizational practice. These tasks are not sequential but iteratively connected and partly built on each other, so the

teacher needs to be proficient in all tasks to be considered to have highly innovative behavior (Dorenbosch et al., 2005; Messmann & Mulder, 2012).

Teacher innovative behavior depends on several factors, such as organizational climate, leader characteristics, support, and also personal characteristics (Bednall et al., 2018; Catio, 2019; Chou et al., 2019; Pieterse et al., 2010; Sagnak, 2012). Among these factors, individual characteristics and cognitive styles play a significant role in shaping teacher innovative behavior, as innovation involves reevaluation and change (Alexander & Van Knippenberg, 2014; Messmann & Mulder, 2015; Runhaar et al., 2016). Teacher innovative behavior encompasses the capacity and readiness to adopt novel ideas and practices that address emerging social needs (Nemeržitski et al., 2013). Consequently, understanding how teachers demonstrate flexible thinking in response to situations and solutions related to these conditions becomes crucial. Extensive research has documented positive outcomes of cognitive flexibility on employee innovative behavior in general (Georgsdottir & Getz, 2004; Isen, 2002; Jeong et al., 2016), but no previous research has been found that directly proves the significant relationship between cognitive flexibility and teacher innovative behavior. Meanwhile, teacher innovative behavior addresses different innovative behaviors where the intended context is specific to the educational context (Messmann & Mulder, 2012). Teacher innovative behavior includes behaviors that are uniquely performed only by teachers, such as fostering the adoption of new methods in teaching and learning and staying updated on the latest concepts within the teaching profession (Messmann et al., 2018; Messmann & Mulder, 2012).

According to Dennis and Vander Wal (2010), cognitive flexibility can also be defined as the ability to switch cognitive sets to adapt to environmental demands. Two dimensions consistently shape cognitive flexibility, namely control and alternative. Control refers to the cognitive ability to perceive difficult situations as controllable; alternative refers to the cognitive ability to perceive and generate multiple alternative solutions for difficult situations. Cognitive flexibility is an important characteristic that helps humans perform complex tasks, such as performing multiple tasks and finding new solutions that quickly adapt to changing demands (Braem & Egner, 2018; Ionescu, 2012; Martin & Anderson, 1998). Cognitive flexibility contributes to how people perceive the task or problem and how people represent their knowledge to find possible strategies to solve the task (Kalia et al., 2019; Krems, 2014; Laureiro-Martínez et al., 2009). People with high cognitive flexibility use existing knowledge, combine information, and reorganize sources to generate new ideas (Mumford et al., 1997). On the other hand, people with low cognitive flexibility will be more rigid in assessing situations, so they are unable to generate new alternative ideas and fail in the execution of innovative behavior (Cañas et al., 2003; Cañas et al., 2006; Zuo et al., 2019).

However, teacher innovative behavior is a wide range of individual behavior (Devloo et al., 2015). Teachers' ability to bring those new ideas into behavior is not only determined by the flexibility of their thinking style but also by the affective states when the teacher faces a specific situation to perform innovative behavior. Blackman and Venn (2010) explain that *affect* refers to emotions or feelings that are perceived and expressed, as well as how these emotions affect our behavior and decisions. According to Watson et al. (1988), affect consists of positive and negative affect. People with high positive affect tend to experience positive emotions and interact positively with others, even in stressful situations. On the other hand, people with high negative affect tend to experience negative emotions, view the world negatively and are inclined to interact negatively in their relationships. Aligned with the principles of affect priming theory (Forgas, 1995) and the broaden-and-build theory of positive emotions (Fredrickson, 2001), positive affect can broaden an individual's cognitive scope, facilitate flexible thinking and problem-solving, and enhance positive performance. In contrast, negative affect is associated with events that hinder the fulfillment of objectives, which, in turn, narrows an individual's thoughts and actions. Several research proved that positive affect was positively associated with teaching innovation, whereas negative affect was negatively associated with displays of innovation (Liu et al., 2017; Montani et

al., 2018; Rank & Frese, 2008). On the other hand, according to the "mood-as-input" model (Martin et al., 1993; 1997), which posit that people utilize their present mood as a form of information, particularly when those experiencing negative affect interpret their mood as a signal to exert greater effort in discovering innovative methods. In addition, several studies show that negative affect has no significant effect on teacher innovative behavior (Li et al., 2017; Madrid et al., 2014). Hence, the relationship is different, so positive and negative affect should be considered separately. In addition, there is limited research to explore whether cognitive or affective factors play a more significant role in the teacher's innovative behavior. It is important to expand the understanding of the theory regarding teacher innovative behavior. Furthermore, by establishing a research foundation that identifies the most influential factors contributing to teacher innovative behavior, focused interventions can be developed to enhance these crucial factors and improve teacher innovative behavior, considering that teacher innovative behavior is an important capability for teachers in facing changes in the education system, especially curriculum changes. Therefore, this study aims to investigate the role of cognitive flexibility, positive affect, and negative affect as predictors for teacher innovative behavior. There are two hypotheses in this study regarding the framework model.

H1: *Cognitive flexibility significantly predicts teacher innovative behavior (model 1).*

H2: *Positive and negative affects significantly predict teacher innovative behavior, after controlling for cognitive flexibility (model 2).*

METHOD

This study used a quantitative research design, utilizing an online survey distributed through social media (Whatsapp and Instagram) and 66 teacher community groups (e.g. BAP Academy, PMM IGI Tangsel, MGMP IPS SMP DKI Jakarta, MGMP IPA SMP Kabupaten Wonosobo, etc). This study involved 322 teachers across three educational levels. The highest number of participants reside in Jakarta (14.6%), followed by West Java (6.8%), Central Java and East Java (5.6%), Gorontalo (4%), and D.I. Yogyakarta and East Kalimantan (3.7%). Nevertheless, participant distribution extends widely from Sumatra to Papua. The age of the teachers varied from 23 to 58 (M = 35.80, SD = 7.81). Male participants comprised 48.4% (n = 156), while female participants represented 51.6% (n = 166) of the study sample. In terms of educational level the teachers taught, 41% of participants taught at the elementary school, 26.7% of participants taught at the secondary school, and 32.3% of participants taught at the high school. On average, participants had 12 years of teaching experience in an average class size of 35 students, with twice the curriculum changes in the educational system during their teaching period (the majority of participants experienced K-13 and *Kurikulum Merdeka*). The data concerning the research participants were anonymized and this is also to ensure that the data obtained during the study were used only for research purposes.

Three instruments were used in this study. They have been adapted to the Indonesian versions. The first instrument, the Teacher Innovative Behavior Scale, developed by Messmann and Mulder (2012) and adapted by Hidayat and Patras (2022), was used to measure the degree of innovative behavior by teachers with four important tasks: opportunity exploration, idea generation, idea promotion, and idea realization. The second instrument, the Cognitive Flexibility Inventory (CFI), was developed by Dennis and Vander Wal (2010) to assess people's perceived capabilities to be flexible in their thinking styles. This instrument is adapted to the Indonesian version by Indrasari (2024). CFI includes 20 items for measuring two dimensions of cognitive flexibility: control and alternative. The third instrument, the Positive Affect Negative Affect Schedule (PANAS), was developed by Watson et al. (1988) to assess individual current affect. PANAS was adapted to the Indonesian version by Akhtar (2019). Specifically for this study, one item was eliminated because, based on the readability test results, teachers in Indonesia are not familiar with affect "strong" so the final number of items used in this study is 19 items. All the questionnaires were analyzed using Statistical Package for Social Sciences (SPSS). First, we cal-

culated descriptive statistics and correlations between the variables. Then, we conducted correlation and multiple regression analysis to test the relationship among teacher innovative behavior, cognitive flexibility, positive affect, and negative affect.

FINDINGS AND DISCUSSION

Findings

Preliminary Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS). Table 1 provides the relationship between all variables, which was addressed using the Pearson correlation.

Table 1. Pearson Correlation Matrix

		M	*SD*	1	2	3	4	5	6	7	8
1.	Age	35.80	7.81								
2.	Experience	12.16	6.37	.81**							
3.	Curriculum Change	2.95	1.60	.43**	.55**						
4.	Class Size	35.69	9.59	-.09	-.03	-.03					
5.	TIB	140.04	13.43	.05	.10	.15**	.10				
6.	CF	83.51	7.41	-.08	-.03	-.11*	.01	.29**			
7.	Positive Affect	31.95	4.72	-.25**	-.20**	-.11**	.20**	.17**	.13*		
8.	Negative Affect	19.71	4.53	-.06	.10	-.08	.03	-.31**	.05	.04	

Note: TIB = Teacher Innovative Behavior, CF = Cognitive Flexibility
** $p < .01$.

The result indicates that cognitive flexibility ($r = 0.29$) and positive affect ($r = 0.17$) was positively associated to teacher innovative behavior with small effect because the effect size is lower than 0.13 (Cohen, 1988). This result means that the higher the cognitive flexibility possessed by teachers and the more teachers experience positive affect towards the changes in the education system, the more likely they perform innovative behavior. In contrast, negative affect was negatively associated to teacher innovative behavior which means that the more teachers experience negative affect towards the changes faced in the education system, the less likely they perform innovative behavior. The effect size for the relationship between negative affect and teacher innovative behavior is 0.09, classified as moderate effect (Cohen, 1988). In terms of demographic factors, out of the four factors, only curriculum change was found to be significantly positively associated with teacher innovative behavior. The effect size for the relationship between curriculum changes experiences and teacher innovative behavior is 0.02, classified as moderate effect (Cohen, 1988). This indicates that the more frequently teachers experience curriculum changes, the more likely they are to engage in innovative behavior.

Assumption Analysis

Several assumption tests need to be conducted to ensure the feasibility of regression analysis. The first assumption test conducted was a normality test to examine whether the data from this research variables were normally distributed. Based on the normality test, the normal graph plot shows dots dispersed around a slanted line, and the population administration is in sync with the line that matches the normality assumption. The graphic is presented in Figure 1.

The next assumption test is to determine the linearity assumption. Examining the correlation outcomes in Table 1, the linearity assumption is confirmed as there are associations among teacher innovative behavior, cognitive flexibility, positive affect, and negative affect. Furthermore, Table 1 clarifies the multicollinearity assumption, indicating that there are no excessively strong relationships among predictor variables ($r < 0.8$), satisfying this assumption. In addition, the multicollinearity assumption is supported by the tolerance and variance inflation factor (VIF) results in Table 2.

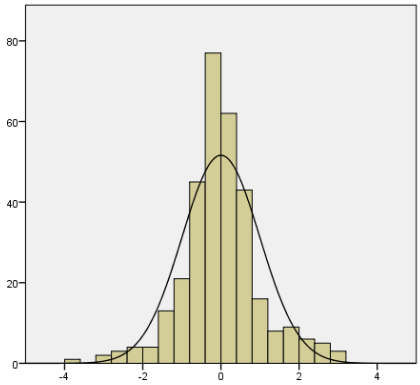

Figure 1. Normal P-Plot of Regression Standardized Residual

Table 2. Tolerance and VIF Test Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	Cognitive flexibility	1.00	1.00
2	Cognitive flexibility	.98	1.02
	Positive affect	.98	1.02
	Negative affect	1.00	1.00

Table 2 demonstrates that the tolerance values for all independent variables exceed the threshold of 0.2 and the VIF values are below 10, indicating no issues with multicollinearity among the predictor variables within the model in this study. In conclusion, based on the assumption test results, multiple regression analysis can be conducted.

Multiple Regression Analysis

We conducted multiple regression analyses with a hierarchical method to investigate the role of cognitive flexibility, positive affect, and negative affect on teacher innovative behavior. In step 1, we analyzed cognitive flexibility as a predictor for teacher innovative behavior. In step 2, we added positive affect and negative affect as predictors for teacher innovative behavior. Table 3 shows the model summary of the R-square, Adjusted R-square, and R-square changes associated with each step in the hierarchical regression. The first model with an R-square of 0.081 indicates that cognitive flexibility only accounts for 8.1% of the variance in teacher innovative behavior, but the F-change for Model 1 is significant. The result of Model 2 indicates an improvement, where R increases from 0.081 in Model 1 to 0.206. The R-square value of 0.206 suggests that Model 2 accounts for 20.6% of the variability of teacher innovative behavior; the F value is still significant but decreases from Model 1. This result means that positive and negative affects are still providing valuable information as predictors for teacher innovative behavior, but the improvement in model fit is not as pronounced.

Table 3. Hierarchical Multiple Regression Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	R-Square Change	F Change	df1	df2	Sig. F Change
1	.285	.081	.78	12.894	.081	28.299	1	320	.000
2	.454	.206	.199	12.022	.125	25.083	2	318	.000

For better illustration, Table 4 shows the coefficients of the significant variables included in the models. All the predictors in Model 2 are significant. Based on Table 4, the regression analysis revealed that cognitive flexibility alone had a significant positive effect on teacher innovative behavior (β = 0.285, SE = 0.097, 95% CI [0.325, 0.707]). Furthermore, Model 2 shows that simultaneously cognitive flexibility (β = 0.281, SE = 0.091, 95% CI [0.329, 0.689]), positive affect

(β = 0.148, SE = 0.143, 95% CI [0.139, 0.703]), and negative affect (β = -0.327, SE = 0.148, 95% CI [-1.262, -0.678]) also significant as predictors for teacher innovative behavior. Among the predictor variables, cognitive flexibility made the most substantial contribution to the model, explaining 28.1% of the variance, followed by negative affect, which explained 32.7% of the variance, and positive affect, which explained 14.8% of the variance. While negative affect accounts for a greater proportion of variance, cognitive flexibility remains the most influential predictor because affect as an additional predictor in Model 2 does not yield the strong impact initially anticipated.

Table 4. Model Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Model 1					
(Constant)	96.910	8.139		11.907	.000
Cognitive Flexibility	.516	.097	.285	5.320	.000
Model 2					
(Constant)	103.175	8.755		11.785	.000
Cognitive Flexibility	.509	.091	.281	5.575	.000
Positive Affect	.421	.143	.148	2.934	.004
Negative Affect	-.970	.148	-.327	-6.533	.000

Hence, the equation of the multiple regression among cognitive flexibility, positive affect, and negative affect toward teacher innovative behavior is as shown in Equation (1) as follows.

$$Y = 103.175 + 0.509\ X1 + 0.421\ X2 - 0.970\ X3 + e \quad (1)$$

From the regression equation in Equation (1), it can be concluded that an increase in cognitive flexibility (X1) by one unit can improve teacher innovative behavior (Y) by 0.509 units. Furthermore, an increase in positive affect (X2) by one unit can improve teacher innovative behavior by 0.421 units. This suggests a positive correlation, meaning that if the teachers have great cognitive flexibility and experience high positive affect, the more likely they perform teacher innovative behavior. In contrast, an increase in negative affect (X3) by one unit can decrease teacher innovative behavior by 0.970 units. This indicates a negative correlation between negative affect and teacher innovative behavior.

Discussion

In the present study, we examined cognitive flexibility, positive affect, and negative affect as predictor factors for teacher innovative behavior. The result reveals that cognitive flexibility positively predicts teacher innovative behavior which means that the higher cognitive flexibility that teachers have, the more likely they perform innovative behavior. In line with the previous research, teachers with greater cognitive flexibility tend to be more flexible in finding divergent solutions to the task (Braem & Egner, 2018; Cañas et al., 2006; Mumford et al., 1997). In line with the dimension of cognitive flexibility, teachers with high cognitive flexibility are also characterized by their ability to perceive that every issue they encounter is something they can internally control (Dennis & Vander Wal, 2010). Consequently, they are more willing to invest effort and time in devising varied solutions. Teachers with high cognitive flexibility are also more capable of adapting by adjusting their cognitive style according to the situations, especially when facing a change (Ram et al., 2019). This adaptability fosters a perception that changes will not hinder their teaching performance (Golestanibakht et al., 2022; Ram et al., 2019). Conversely, teachers may interpret change as an indication of the necessity for innovation, prompting them to demonstrate teacher innovative behavior. On the other hand, when teachers believe they have no control over the situations they face, they tend to resign themselves to such circumstances (Kalia et al., 2019;

Krems, 2014; Laureiro-Martínez et al., 2009). This resignation leads to a preference for quick solutions without assessing their quality or exploring alternative possibilities (Kiss et al., 2020; Laureiro-Martínez et al., 2009). Teachers with low cognitive flexibility are characterized by a tendency to display rigid reactions and judgments, ultimately leading to a propensity for avoidance (Cañas et al., 2006; Latzman & Masuda, 2013). They may try to convince themselves that existing solutions are still effective, resulting in a lack of desire to exhibit innovative behavior.

However, the relationship between cognitive flexibility and teacher innovative behavior is relatively weak. This may occur because teacher innovative behavior is a wide range of individual behavior that cannot rely solely upon the flexibility of their thinking style (Devloo et al., 2015). Even when teachers can cognitively identify needed changes and generate new ideas, they still require the courage to implement the desired innovative behavior (Nemeržitski et al., 2013; Pyhältö et al., 2012). In addition, emotional factors also play a role in determining whether teachers are willing to invest more time and effort to realize their innovative ideas and demonstrate innovative behavior in teaching (Wu et al., 2022). Therefore, this study also explores the role of positive affect and negative affect through hierarchical multiple regression analysis.

Similarly with the previous result, the regression analyses show that positive affect positively predicts teacher innovative behavior. Consistent with the principles of affect priming theory and the broaden-and-build theory of positive emotions, positive affect can broaden an individual's cognitive scope, facilitate flexible thinking and problem-solving, and enhance positive performance (Forgas, 1995; Frederick, 2005). When teachers experience positive affect during the educational system changes that they face, such as being excited, they tend to perceive such changing conditions as a challenge for them to demonstrate better performance in teaching, whether through more diverse teaching methods or an enhancement of knowledge about teaching (Cai & Tang, 2022). Teachers with a higher tendency for positive affect might also perceive that the situations they face are a sign for them to develop skills, as previous teaching strategies may no longer be relevant (Cai & Tang, 2022; Li et al., 2017). Positive affect allows teachers to concentrate on discovering new solutions to adjust to changes, rather than focusing on identifying negative aspects of the changes (Rank & Frese, 2008). Positive affect also serves as a motivation for individuals to devise innovative approaches to their tasks, including in teaching activities (Li et al., 2017). Teachers with a positive affect are inclined to be more open in perceiving situations, enabling them to better formulate alternative solutions to a given scenario. This openness also enables teachers to be more spontaneous in contemplating various solutions, expressing new ideas, and attempting to implement those ideas (Fay & Frese, 2001; George & Brief, 1992).

On the other hand, this study shows that negative affect negatively predicts teachers' innovative behavior. This result is consistent with the previous research that explains negative affect can narrow an individual's thoughts and actions (Forgas, 1995; Fredrickson, 2001). Teachers who feel more negative emotions when confronted with a situation are prone to adopt a closed mindset in their perception of that situation. Consequently, teachers may limit themselves to a single perspective. Teachers characterized by high levels of negative affect also lean towards being apathetic, leading to a lack of willingness to exert the necessary effort in devising alternative solutions. In addition, high negative affect can also trigger a sense of distrust toward the occurring change, for instance, believing that the change should be avoided and is not urgent to implement (Cheung et al., 2016). Consequently, the inclination to demonstrate innovative behavior in dealing with these changes is diminished. Previous studies have indeed indicated that negative affect can motivate teachers to exhibit innovative behavior because negative affect is perceived as a signal to exert greater effort in discovering innovative methods (Martin et al., 1993). Negative affect such as feelings of tension and dissatisfaction may be needed for triggering innovative problem-solving (Anderson et al., 2004; Madjar et al., 2002). However, this study found that negative affect plays a stronger role in hindering teacher innovative behavior.

Concerning the comparison of the roles among the three significant predictor variables in predicting teacher innovative behavior, the results of hierarchical regression analysis indicate that

cognitive flexibility is the factor with the most substantial contribution compared to the affect factor. These results are derived from the model's significance, where cognitive flexibility emerges as the sole predictor compared to the second model, where both cognitive and affective factors collectively serve as predictors for teacher innovative behavior. This result implies that cognitive factors have a greater potential to drive innovative behavior in teachers compared to affect, considering that innovative behavior itself is fundamentally based on rethinking and changing. The overlapping thought processes between cognitive flexibility and teacher innovative behavior establish a strong connection between the two constructs. Therefore, it is crucial to ensure that teachers possess good cognitive flexibility before expecting them to demonstrate innovative behavior. In addition, regarding the role of positive and negative affect, negative affect plays a greater role in predicting teacher innovative behavior. The weak role of positive emotions in predicting teacher innovative behavior may be because positive emotions are not strong enough to stimulate teachers to innovate. When teachers experience positive emotions, they tend to perceive themselves as being in a comfortable state where change is not needed (Avey et al., 2008; Madrid, 2020). Although teachers are inclined to innovate in the learning process, they may not perceive a strong need for such changes (Avey et al., 2008; Rehman et al., 2021). This result means to encourage teachers' innovative behavior, and especially in the face of changes, it would be more effective to prevent teachers from experiencing negative affect related to those changes. The negative affect felt by teachers may be linked to discomfort with outdated teaching habits that are no longer relevant, thereby prompting teachers to be more motivated to make changes (Cheung et al., 2016). In this way, the negative affect will not hinder teachers from demonstrating innovative behavior.

In line with the current curriculum changes happening in Indonesia, teacher innovative behavior becomes a crucial aspect that can assist teachers in facing these changes optimally. According to the results of a preliminary study, teachers are still struggling to adapt to the new curriculum as they are required to be more innovative in their teaching strategies (Baskaran & Rajarathinam, 2018; Ministry of Education, Culture, Research, and Technology, 2023). In this situation, competencies in teacher innovative behavior are needed. Several important aspects can support teachers' innovative behavior, namely cognitive flexibility, positive affect, and negative affect. This study shows that implementing curriculum changes without considering teacher competencies is not feasible, as teachers often struggle to implement the new curriculum without internal readiness. In addition, the current curriculum changes are not the final changes to be implemented by the Indonesian government. Teachers must always be prepared for other changes that will occur in the future, including curriculum changes.

Based on the result, this research has several important implications, both theoretical and practical. Firstly, the findings enrich the foundational literature explaining the relationship between cognitive flexibility, affect, and teacher innovative behavior. Secondly, this study also broadens the explanation that teacher innovative behavior is a complex behavior that is influenced not only by thinking styles but also by individual affect. This study contributes to the literature by highlighting that positive and negative affects play different roles in predicting teacher innovative behavior. Thirdly, this study can also be used as an evaluation framework regarding the essential capabilities that teachers must possess to maximize the changes they encounter in the educational system. The governments and policymakers should consider several methods to improve teacher innovative behavior through cognitive flexibility and affect, such as training and socialization. They should consider not only external factors such as an environment that supports innovation and a supportive organizational climate but also internal factors that can be developed by the teachers themselves to encourage the emergence of innovative behavior, especially in teaching activities. Indeed, the demonstration of teacher innovative behavior is a crucial aspect for Indonesian educators to effectively adapt to changes in the educational system, encompassing evolving requirements for teaching methodologies.

Despite the implications, this study still grappled with two principal limitations. The first limitation is the use of self-reporting as the data collection method. While self-reporting is a very common method used in quantitative research, it must be recognized that the data collected are inevitably subject to bias arising from participants' perceptions. Future research can maintain the use of self-report methods for data collection while also considering the incorporation of alternative approaches, such as interviews, to enhance the depth of research outcomes. The second limitation is related to the cross-sectional study method, which means the data collection was carried out on a single occasion (at a single point in time). Participants were instructed to fill out the instrument based on their feelings in the past week, but the affect is likely to be fluctuating during that week. However, George (1991) explains that state affect can still be measured and has a significant impact on individual behavior, including teacher innovative behavior. Future research should consider alternative methods, such as longitudinal studies, to ensure the role of affect over a specific period in teacher innovative behavior.

CONCLUSION

The current study shows that cognitive flexibility, positive affect, and negative affect are a significant predictor of teacher innovative behavior. Specifically, cognitive flexibility and positive affect positively predict teacher innovative behavior, while negative affect negatively predicts teacher innovative behavior. Furthermore, cognitive flexibility and positive affect play weaker roles compared to negative affect, which moderately predicts teacher innovative behavior. However, based on the multiple regression results, cognitive flexibility still plays a more crucial role in predicting teacher innovative behavior because the second model, which includes negative affect and positive affect, does not bring significant changes in predicting teacher innovative behavior. Regarding the affect factors, negative affect holds a greater effect than positive affect in predicting teacher innovative behavior. These findings suggest that the weak role of positive affect in predicting teacher innovative behavior indicates that teachers are more motivated to demonstrate innovative behavior when experiencing negative affect, such as discomfort due to outdated systems that are no longer relevant in the learning process. Further research can examine the role of other variables that may predict teacher innovative behavior, considering that two variables in this research model show weak relationships with teacher innovative behavior. In conclusion, this study provides policymakers with a deeper understanding of the predictors of teacher innovative behavior as a foundation to better evaluate and assist teachers' capabilities in dealing with change in the education system through their cognitive capabilities and affective states.

DISCLOSURE STATEMENT

The authors declare that they have no potential conflicts of interest to disclose.

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