LEADING TEACHER COLLABORATION IN ELEMENTARY SCHOOL THROUGH SCHOOL LEADER ADAPTIVE SKILLS: A PLS-SEM APPROACH

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Abstract. The purpose of this study was to examine the relationship between school leaders' adaptive leadership skills and teacher collaboration in schools and explore how the implementation of adaptive leadership skills determines teacher collaboration. The study was conducted using a cross-sectional survey with a sample of 384 elementary school teachers from 65 public elementary schools in Bogor district, West Java, Indonesia. The data were collected through the adaptive leadership skills scale and the teacher collaboration survey. Structural Equation Modeling (SEM) with partial least squares was used to estimate relationships among the variables. The study findings indicate that adaptive leadership skills (emotional intelligence, organizational culture, character, and development) were significantly and positively related to teacher collaboration in schools. The findings and theoretical implications are discussed according to the related literature.

Keywords**:** Adaptive Leadership Skills; Teacher Collaboration; Elementary School

I. INTRODUCTION

The role of elementary schools in preparing future generations during the era of the Fourth Industrial Revolution involves equipping teachers with the necessary skills to respond to the demands of this technological revolution (Rachmadtullah et al., 2020). However, numerous studies have been developed to promote or enhance collaborative activity in educational settings, in response to research indicating that collaboration can enhance student achievement and reduce teacher conservatism towards change (Hargreaves, 2019). According to Nias (2005), professional development as a part of the school development of a teacher is greatly influenced by the collaboration of teachers. These relationships play a crucial role in providing technical and emotional support, serving as a reference group for the teacher to identify with, offering opportunities for professional growth, and enabling the teacher to exert influence on others. Specifically, Torres (2019) described collaboration among teachers in the school is important part of school culture.

The focal point of teacher collaboration exhibits a wide range of diversity, encompassing various levels of engagement that span from superficial interactions to more profound and meaningful collaborations. The extent of collaboration is associated with the level of team entitativity, as profound levels of collaboration necessitate a greater degree of team entitativity (Vangrieken, Dochy, Raes, & Kyndt, 2015). Hargreaves in Dickerson (2011) describe collaboration as behavior articulating and integrating principles for school improvement, providing a way for teachers to learn from each other, gain moral support, coordinate actions, and reflect on their classroom practices.

Collaborative activities enrolled to exchange activities that can be positioned on the more independent activities include exchanging ideas, materials, and learning experiences; talking about classroom practice; and discussing educational theories and innovation, but Professional collaboration that has higher levels of interdependence refers to activities such as developing teaching and test materials and preparing lessons with colleagues, team teaching, and experimenting with teaching methods with colleagues with an openness to

constructively discuss disagreements. (Vangrieken & Kyndt, 2020). Dickerson (2011) argued that collaboration among teachers is to reduce levels of teacher isolation so that teachers can share professional practices and have occasion to observe each other in the classroom or discuss their work, such as engaging with each other and sharing their experiences, provided them with much-needed emotional support, made them feel affirmed as worthy professionals, increased their ability to apply new teaching methods and materials, allowed them to train each other, provided them with a greater perspective of the entire school system, and made them more accepting of diverse perspectives.

The involvement of the principal in collaborative exchanges as a member of the community is crucial for the development of effective schools, as it facilitates significant engagement between the principal and teachers (Park & Ham, 2016). To develop a collaborative culture among teachers in the school, Waldron and McLeskey (2010) suggested that principals need to have the willingness to share leadership responsibilities with others and empower others to share in decision-making regarding substantive issues where the principal also understands what a collaborative culture is, why it is important, and actively supports the development and maintenance of such a culture. principal leadership, which leads to a dynamic process as opposed to a static role embodiment, determines the collaboration among teachers (Torres, 2019). Edmonson et al. (2001) suggested that a leader who can empower and also reveal inclusivity for employees could support the best pattern of collaborative culture, in which every member has high awareness of how to contribute to the organization.

Adaptive leadership serves as a valuable tool for leaders to effectively navigate the unpredictable environment in which schools operate. Furthermore, adaptive leadership enables these leaders to successfully overcome adaptive challenges that pose a threat to the continued existence of their organizations (Nelson & Squires, 2017). Bradberry and Greaves (2012) suggested adaptive leadership skills that are suitable for school leader, such as emotional intelligence, organizational justice, character, and development. According to Northouse (2021), the adaptive leadership process encompasses four distinct perspectives: a system perspective, which is perceived as multifaceted entities characterized by their dynamic nature, capable of evolving and undergoing transformations, and interconnected through a network of relationships; From a biological perspective, adaptation enables individuals to progress and thrive in novel settings because individuals undergo development and growth as a consequence of their need to adjust to both internal and external factors. From a service orientation perspective, an adaptable leader leverages their expertise or authority to effectively serve individuals by diagnosing their challenges and assisting them in identifying and implementing appropriate solutions. From a psychotherapeutic perspective, adaptive leaders possess an understanding that individuals require a conducive setting in order to effectively navigate challenging situations, wherein they can differentiate between fictitious constructs and actuality, resolve internal conflicts, and acquire novel mindsets and behaviors.

The adaptive school leader assumes the role of a facilitator in cultivating robust collaborative relationships and engaging others in the process of enhancing their collective capacity to achieve mutually agreed-upon objectives (Squires, 2015). his study focuses on the exploration of school leader adaptive leadership skills based on the Leadership 2.0 framework by Bradberry and Greaves (2012) to improve teacher collaboration toward achieving the best performance for teachers. Consequently, we aimed to show the relationship between adaptive leadership skills and teacher collaboration in an elementary school context. The research questions that guided our study were:

1. Are adaptive leadership skills affecting teacher collaboration in the elementary school context?
2. To what extent can the implementation of adaptive leadership skills (emotional intelligence, organizational justice, character, and development) determine teacher collaboration in elementary school?

II. RESEARCH METHOD

In this research, quantitative research was employed to explore the impact of adaptive leadership skills (X) on teacher collaboration (Y). The research methodology is outlined as follows:

A. Data collection

The criteria adopted for selecting respondents included that the participant be a teacher who works in elementary schools and has had teaching experience in the current school for at least one year. 424 teachers from 45 public elementary schools in Bogor District, West Java, Indonesia.

The random sampling method was used to get a representative sample, and valid questionnaires were recovered, yielding a valid recovery rate of 90%. In the current study, 47.2% and 52.8% of the participants were men and women, respectively. They had finished the study on bachelor's (85%) and master's (0,8%), while 14.3% of respondents are studying bachelor. Further, 24,1% of the participants had worked 1–5 years, 23,3% had worked 6–10 years, 23,3% had worked 11–15 years, 17,6% had worked 16–20 years, and 11,7% had worked more than 20 years in the school. Regarding teacher position, in the elementary school context in Indonesia, 82.1% of teachers are homeroom teachers and 17.8% are class teachers.

B. Variables and Measures

Instruments for adaptive leadership skills and teacher performances are developed based on theories underlying research variables (Creswell & Creswell, 2017). The paper-

based questionnaire was used to assess the following variables: Adaptive leadership skills were assessed following the scale from Bradberry and Greaves (2012), which described four components, such as emotional intelligence, which consisted of N=4 items (e.g., a school leader has the ability to control self-emotion), and organization justice, which consisted of N=3 items (e.g., 'School leaders understand how to make decisions through fair processes to increase the productivity of teachers). Character consisted of N = 3 items (e.g., the school leader has rules and attitudes that match behavior), and development consisted of N = 2 items (e.g., the school leader gives teachers the opportunity to improve knowledge and build new skills).

Teacher collaboration was assessed following the scale from Nugroho (2018) and considering the elementary school context in Indonesia using N = 9 items (e.g., the culture of this school has open and transparent communication between the head of the school and the teaching staff). The scale was sufficiently reliable.

C. Data Analysis

Structural Equation Modeling with Partial Least Squares (SEM-PLS) was employed to analyze the data. The property of enhanced statistical power in Partial Least Squares Structural Equation Modeling (PLS-SEM) is particularly advantageous in the context of exploratory research that investigates theories that are less developed or in the process of development (Hair, Risher, Sarstedt, & Ringle, 2019). Thus, the SEM PLS method is more appropriate than CB SEM (Hair Jr, Matthews, Matthews, & Sarstedt, 2017). Two basic steps in structural equation modeling (SEM) were enrolled using Smart PLS 3.0. Firstly, we evaluated the measurement model with indicator loading, consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019).

III. FINDINGS

The key constructs involved in the current study include adaptive leadership skills and teacher collaboration.

A. **Measurement model assessment**

The application of structural equation modeling (SEM) in combination with Smart-PLS is utilized for the analysis of survey data.

Indicator loading examination

Indicators with loadings of 0.7 or above are considered significant indicators, while Hulland (1999) suggested that items with loadings of less than 0.4 should be dropped, and items with loadings between 0.4 and 0.7 should be reviewed and may be dropped if they do not increase composite reliability.

Consistency reliability

Cronbach's alpha is a measure of the reliability (or consistency) of the data. Table 1 shows that the values of the Cronbach alpha of all variables are higher than 0.7, which fulfills the cutoff suggestion (Hair Jr et al., 2017). Moreover, in consistency reliability assessment with other methods such as composite reliability, table 1 shows that CR for both constructs is satisfactory to good (Hair et al., 2019). These

results indicate that our measurement model exhibits good internal consistency.

Convergent validity

Convergent validity can be evaluated by examining the outer loadings of the indicators to determine the average variance extracted (AVE) from each construct. Hair Jr et al. (2017) suggested the rule of thumb for adequate convergence is an AVE > 0.50. Table 1 shows AVE of Adaptive Leadership Skills is 0.633 and the AVE of Teacher Collaboration is 0.589. thus, it revealed the construct explains More than 50 percent of the variance of the items that make up the construct (Hair et al., 2019).

TABLE I
RESULTS OF MEASUREMENT MODEL ASSESSMENT

Variable	Indicators	SLF	VIF	α	CR	AVE
Adaptive Leadership Skills R^2= 0.571				0.807	0.873	0.633
	Emotional intelligence (EI)	0.782	1.581			
	Organizational justice (OJ)	0.861	1.955			
	Character (CHA)	0.709	1.473			
	Development (DEV)	0.823	1.732			
Teacher collaboration				0.766	0.850	0.589
	Ambiguity tolerance (AT)	0.762	1.459			
	Long-term view and anticipate changes (LVA)	0.823	1.746			
	Encouragement of communication and dialogue (ECD)	0.848	1.872			
	Teamwork (TW)	0.618	1.266			
Notes: n= 364. SFL= standardized factor loading, CR, composite reliability, AVE, average variance extracted, α, Cronbach α						

Discriminant validity

Discriminant validity denotes that a construct is empirically unique from the other constructs in the SEM. Voorhees, Brady, Calantone, and Ramirez (2016) recommend assessing HTMT criteria. Based on our analysis, it can be concluded that none of our measurement constructs meet the HTMT 0.90 criterion. Therefore, there is sufficient evidence to support a construct that is empirically distinct from other constructs in the structural model (Hair et al., 2019).

TABLE 2
DISCRIMINANT VALIDITY

Constructs	1	2
Adaptive Leadership Skills	0.796	
Teacher Collaboration	0.755	0.768

B. **Structural model assessment**

After measurement models were fitted, structural models were assessed by running a bootstrapping procedure with a resample of 5000 (Hair Jr et al., 2017). The results of the hypotheses testing are displayed in Figure 1. Our findings confirm that adaptive leadership qualities

have a strong and statistically significant effect on teacher collaboration ($\beta = 0.755$, p=0.000).
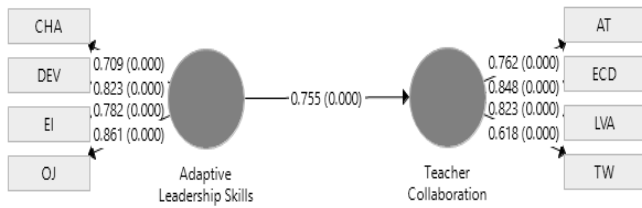

Fig. 1 Result of the structural model test

IV. DISCUSSION

In this study, we examined the impact of adaptive leadership skills on teacher collaboration. Adaptive leadership skills positively correlated with and predicted teacher collaboration. The findings of the study provide evidence that adaptive leadership skills are crucial for the development of teacher collaboration in schools. A school leader certainly needs some skills such as emotional intelligence, development, character, and organizational justice to drive the organization. In this era, school leaders are not only required to give the best behavior to lead the school stakeholders but also to have important skills that could help deal with and solve problems in organizations.

The result demonstrated that adaptive leadership skills had a strong positive effect on teacher collaboration. Studies have demonstrated that teacher collaboration has been linked to several types of leadership, including behavior or skill. This finding is in line with past studies that established the link between principal leadership and teacher collaboration in school contexts (Laudert, 2018; Olayvar, 2021; Parlar, Turkoglu, & Cansoy, 2021). This finding also confirmed the previous study's findings on the role of principal leadership skills in affecting positive organizational behaviour (Richter, Lewis, & Hagar, 2012).

V. THEORETICAL IMPLICATIONS

The process of addressing adaptive problems often elicits a variety of adverse emotions, including distress and anxiety. Adaptive leaders, however, possess the capacity to endure pressure and remain resolute in the midst of change (Heifetz, Heifetz, Grashow, & Linsky, 2009). The emotionally skilled leader can express emotions accurately and identify false emotions not only of their own feelings but also those of their followers (Chen & Guo, 2020). A school leader with sufficient emotional intelligence has a thumb point on self-awareness that refers to Self-awareness is the ability to direct one's attention towards oneself, actively recognizing, analyzing, and retaining information pertaining to one's own identity (Morin, 2011), and social awareness is the capacity to effectively see and comprehend the emotional states of others as well as discern the underlying dynamics at play inside them. This leader recognizes and develops relationships that are

needed to lead others to communicate with each other regarding some programs in the school. Starting with awareness about self-emotion until enrollment, good relationship management is also key to driving school stakeholder engagement regarding the problems and challenges during the change process. These domains are very essential to building trust among teachers to work together, especially to deal with change in school. For instance, the change in curriculum policy and other policies is a challenge that teachers cannot stand alone to implement correctly.

A school leader who implies the value of organizational justice strongly predicts the trust of the school member because it implies a willingness to be vulnerable to another and because justice perceptions provide critical information regarding the likelihood of fair treatment within the organization (Kerwin, Jordan, & Turner, 2015). Furthermore, a school leader with good decision-making fairness, sharing information, and concern for the outcome supports the school member, especially teachers, to receive and have a sense of fairness regarding various perspectives of a colleague or student. Collective learning and collaboration by a lot of members of the organization. Leaders can encourage and facilitate these processes, such as information exchange and the individual empowerment of organizations to adapt to change (Sarid, 2021).

A school leader also needs to improve their good character, especially their integrity and credibility, not only to interact with school stakeholders but also to foster teamwork among teachers to discuss ideas or problem solving and build the school project that involves the family or community. Simons, Leroy, Collewaert, and Masschelein (2015) explained that Moral integrity refers to the unwavering explained that moral integrity refers to the unwavering commitment to upholding principles that are widely recognized and accepted throughout society as morally appropriate, while behavioral integrity refers to the perceived congruence between an individual's verbal expressions and their corresponding actions, irrespective of the moral implications involved. These components of the character of a leader are essential to helping teachers work together and form solid teamwork. A school leader with credibility possesses robust interpersonal skills and is perceived as trustworthy, honest, and believable (Williams Jr, Raffo, Randy Clark, & Clark, 2022). Thus, a school leader who wants to drive teacher perceptions from different perspectives needs to show and implement these characters.

Finally, findings show that the spirit of development is an important indicator of adaptive leadership skills. The concept revolves around a leader's commitment to continuous self-improvement and their dedication to fostering the growth of others by providing them with the chance to acquire new knowledge through self-directed learning. The teacher perceived that building capacity is important, especially to interact with others and engage in collaboration. It is important to realize that deep-level collaboration necessitates more than just the exchange of activities and professional collaboration; it also necessitates an openness to engage in

constructive discussions regarding disagreement (Vangrieken et al., 2015).

VI. CONCLUSION

A school leader needs to improve and implement adaptive leadership skills in the school, including emotional intelligence, organization culture, credibility, integrity, and character, and also develop himself and others. As a result, we can say that a leader with strong adaptive. leadership skills may exhibit more teacher collaboration. Considering the clear effect of school leaders on teacher collaboration in schools, policymakers should facilitate the development and strengthening of adaptive leadership skills. Furthermore, given the effects of the sub-dimensions of long-term view and anticipated changes; encouragement of communication and dialog; teamwork; and ambiguity tolerance on teacher collaboration, school leaders should focus on implementing these specific functions.

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