

Development and validation of a teacher efficacy scale in the Indonesian context

Pengembangan dan Validasi Skala Efikasi Guru dalam Konteks Indonesia

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ARTICLE INFO:

Received: 2025-05-12
Revised: 2025-10-03
Accepted: 2025-10-06

Keywords:

Teacher efficacy scale, validation, construct validity, confirmatory factor analysis

Kata Kunci:

Skala efikasi guru, validasi, validitas konstruk, analisis faktor konfirmatori

ABSTRACT

Teacher efficacy plays a crucial role in determining the quality of learning and the success of the educational process. However, measurement instruments that are relevant to the Indonesian cultural and educational context remain limited. This study aims to develop and validate a Teacher Efficacy Scale in Indonesia. The scale construction was based on Bandura's (1997) self-efficacy theory, which consists of three dimensions – level, strength, and generality – and followed the standard procedures for psychological scale development, including theoretical identification, conceptualization, operationalization, construction, content validity testing, construct validity testing, reliability analysis, and finalization. Participants consisted of 102 public elementary school teachers in Padang, Indonesia, all of whom were civil servants. Confirmatory Factor Analysis (CFA) was conducted through nine stages of item selection based on loading factors, standardized residual covariances, and modification indices. The final CFA model retained seven valid items with loading factors above 0.50 and demonstrated a good model fit ($X^2 = 19.210$; $p = 0.057$; $GFI = 0.952$; $AGFI = 0.878$; $CFI = 0.982$; $TLI = 0.966$; $RMSEA = 0.086$). The findings indicate that the developed scale possesses strong validity and reliability and can be used to measure teacher efficacy among Indonesian elementary school teachers. Practically, this instrument may serve as a valuable tool for research, psychological assessment, and teacher development programs aimed at enhancing professional competence.

ABSTRACT

Efikasi guru berperan penting dalam menentukan kualitas pembelajaran dan keberhasilan proses pendidikan. Namun, instrumen pengukuran yang sesuai dengan konteks budaya dan sistem pendidikan di Indonesia masih terbatas. Penelitian ini bertujuan untuk mengembangkan dan memvalidasi Skala Efikasi Guru yang relevan dengan konteks Indonesia. Penyusunan skala mengacu pada teori efikasi diri Bandura (1997) yang terdiri atas tiga dimensi – level, strength, dan generality – serta mengikuti tahapan pengembangan alat ukur psikologi yang mencakup identifikasi teori, konseptualisasi, operasionalisasi, konstruksi, uji validitas isi, uji validitas konstruk, uji reliabilitas, dan penyusunan skala final. Partisipan penelitian adalah 102 guru sekolah dasar negeri di Kota Padang yang berstatus Pegawai Negeri Sipil. Analisis faktor konfirmatori (CFA) dilakukan melalui sembilan tahap seleksi item berdasarkan nilai *loading factor*, *standardized residual covariance*, dan *modification indices*. Model CFA akhir menghasilkan **tujuh aitem valid** dengan *loading factor* di atas 0,50 dan menunjukkan kecocokan model yang baik ($X^2 = 19,210$; $p = 0,057$; $GFI = 0,952$; $AGFI = 0,878$; $CFI = 0,982$; $TLI = 0,966$; $RMSEA = 0,086$). Hasil ini menunjukkan bahwa skala yang dikembangkan memiliki validitas dan reliabilitas yang baik, serta dapat digunakan sebagai alat ukur efikasi guru sekolah dasar dalam konteks Indonesia. Secara praktis, instrumen ini dapat dimanfaatkan dalam penelitian, asesmen psikologis, serta program pengembangan kompetensi dan profesionalisme guru.

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How to cite: Purna, R. S. (2025). Development and validation of a teacher efficacy scale in the Indonesian context. *Jurnal Psikologi Tabularasa*, 20 (2), 329-342. doi: <http://doi.org/10.26905/jpt.v20.i2.15597>

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1. INTRODUCTION

Teachers play a crucial role in determining the quality of both the learning process and its outcomes. However, in practice, many teachers continue to face challenges in classroom management, adapting to curriculum policies, and meeting professional demands. These conditions often create emotional pressure and a lack of self-confidence in carrying out teaching responsibilities. This phenomenon highlights the importance of teachers' confidence in their own abilities to manage various learning situations. Such confidence is known as self-efficacy, defined as an individual's belief in their capability to organize and execute the actions required to attain desired outcomes (Bandura, 1997).

Self-efficacy has a broad influence on individuals' cognitive, affective, and behavioral aspects. Research indicates that teachers with high self-efficacy are better able to manage stress, persevere through difficulties, and effectively regulate the learning process (Matthews, Deary, & Whiteman, 2003; Sutton & Wheatley, 2003). Conversely, teachers with low self-efficacy tend to give up easily, exhibit less patience with problematic students, and display negative emotions during teaching (Weasmer & Woods, 1998). Therefore, self-efficacy serves as one of the key factors influencing both teaching quality and teachers' psychological well-being.

As professional and educational policy demands continue to evolve, it is necessary to develop a teacher efficacy measurement instrument that aligns with current social and cultural contexts. The use of foreign measurement tools often fails to reflect the realities of Indonesian education, which possesses distinctive characteristics in terms of system, cultural values, and teacher-student interactions. Hence, the development and validation of a contextually relevant teacher efficacy scale constitute an essential step toward obtaining a more accurate and locally appropriate assessment tool.

The theory of self-efficacy underlying this study was proposed by Bandura (1986, 1997) within the framework of social cognitive theory. According to him, self-efficacy comprises three main dimensions: level (the perceived difficulty of tasks that one believes can be accomplished), strength (the intensity of one's confidence in their abilities), and generality (the belief in one's capability to handle a variety of situations). The third dimension reflects the extent to which an individual believes they can organize and execute actions necessary to achieve specific goals. In the context of teaching, self-efficacy reflects the degree to which teachers believe in their ability to teach effectively, manage classrooms, and address challenges within educational environments.

A number of teacher efficacy instruments have been developed across various countries. The Teacher Efficacy Scale (TES) by Gibson and Dembo (1984) is one of the earliest instruments, assessing two main aspects: personal teaching efficacy and general teaching efficacy. Subsequently, the Teachers' Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Hoy (2001) was designed to measure three aspects—instructional strategies, classroom management, and student engagement. These instruments have been widely used

in international research (Klassen et al., 2009; Zee & Koomen, 2016); however, most were developed within Western cultural contexts that differ significantly from the educational conditions in Indonesia.

Differences in social context, educational systems, and cultural values have resulted in foreign-developed teacher efficacy instruments not fully capturing the beliefs and experiences of teachers in Indonesia. Moreover, previous studies in Indonesia have generally focused on adapting foreign instruments without developing and validating new models based on local contexts. Consequently, there remains a research gap in the absence of a teacher efficacy scale that has been genuinely developed and validated in accordance with the conditions of the Indonesian education system. The novelty of this study lies in the development of a new instrument grounded in Bandura's theory, which is empirically tested through confirmatory factor analysis (CFA) involving Indonesian elementary school teachers as participants.

Based on these considerations, this study aims to develop and validate the Elementary School Teacher Efficacy Scale within the Indonesian context. This instrument is expected to provide a theoretical contribution by offering a valid and reliable measurement tool for teacher efficacy, as well as a practical contribution in enhancing teachers' self-confidence, performance, and professionalism in Indonesia.

2. MEHODS

Population and Samples

The population of this study consists of civil servant (PNS) teachers who are actively teaching at public elementary schools (SDN) in the city of Padang. The research sample includes 102 elementary school teachers selected using the incidental sampling technique, a method in which respondents who are encountered by the researcher and meet predetermined criteria are included as participants. The sample size of 102 was chosen as it meets the minimum requirement for confirmatory factor analysis, as stated by Kline (2011), who suggested that a sample size between 100 and 200 is considered adequate for Confirmatory Factor Analysis (CFA). The limited accessibility of civil servant teachers within the study area serves as the basis for this sample size.

Instrument Development

The measurement of teacher efficacy was developed based on Bandura's (1997) concept, which includes three aspects: level (task difficulty), strength (degree of confidence), and generality (generality across situations). The instrument was designed by considering the relationship between manifest variables (measurable indicators) and latent variables (constructs). According to Kline (2011), indicators are observed values used to measure latent constructs that cannot be directly assessed. Thus, the scale items function as indicators in factor analysis.

The instrument development followed the procedures for psychological scale construction as outlined by Azwar (2014), namely: (1) theoretical identification, (2) conceptualization, (3) operationalization, (4) construction, (5) content validity testing, (6) construct validity testing, (7) reliability testing, and (8) preparation of the final scale. In the initial stage, the construct was defined and operationalized based on a review of relevant literature, followed by the development of new scale items suited to the research context.

Content Validity

Content validity was assessed through expert judgment. The instrument was reviewed by three experts: (1) a lecturer in educational psychology, (2) a lecturer in guidance and counseling, and (3) a practitioner in elementary education. The experts were asked to evaluate the relevance, clarity, and representativeness of each item in relation to the construct dimensions. The assessment was conducted using the Content Validity Index (CVI) as recommended by Polit and Beck (2006), with the criterion that an item is considered acceptable when it obtains an I-CVI value of ≥ 0.78 for three evaluators.

Construct Validity

Construct validity was examined through factor analysis. Ideally, the development of a new instrument begins with Exploratory Factor Analysis (EFA) to explore the factor structure, followed by Confirmatory Factor Analysis (CFA) to test model fit (Hair et al., 2014). However, this study directly employed CFA because the teacher efficacy construct was grounded in Bandura’s (1997) well-established theoretical framework, which has been validated in numerous prior studies. The CFA was conducted by considering the loading factor, standardized residual covariance, and modification indices to identify valid items.

Table 1. Self-Efficacy Scale Blueprint

No	Aspects	Indicators	Items		TOTAL
			F	UF	
1	Level	Able to perform difficult tasks, including dealing with stressors	1,2,3,4,5, 6	7, 8, 9, 10	10
2	Strength	Persistent and not easily swayed by unfavorable experiences	11, 12, 13, 14, 15	16, 17, 18, 19	9
3	Generality	Confident in one's abilities in a broader field	20, 21, 22,23, 24, 25, 26	27, 28, 29	10
TOTAL					29

3. RESULTS AND DISCUSSION

The validity test conducted in this study employed content validity. This validity was assessed through professional rational judgment of the constructed scale. The scale or instrument was reviewed by experts (expert judgment) who examined and evaluated the

items. The expert review process was carried out through consultation and discussion with the experts. In addition, the researcher conducted a readability test with one elementary school teacher from SDN Koto Tengah, Padang. Items that passed the content validation process were then reorganized according to the previously designed blueprint.

The second stage involved developing and specifying the measurement model. The specification process completed the measurement model by including measurement relationships between items and constructs, correlational relationships among constructs, and error terms for the items. The construct validity of the research instrument was tested using confirmatory analysis or Confirmatory Factor Analysis (CFA). The confirmatory test aimed to verify whether the items and dimensions served as valid indicators of their respective constructs.

Reliability refers to the consistency or trustworthiness of a constructed test instrument and the extent to which its measurement results can be considered dependable. The reliability test employed the alpha coefficient technique. Construct reliability was determined using the criterion value of > 0.7, tested with Cronbach's Alpha. For comparison, the composite reliability value was also presented and calculated using the following formula:

$$\text{Construct reliability} = \frac{(\sum \text{standardized loading})^2}{(\sum \text{standardized loading})^2 + j}$$

Standardized loadings were obtained directly from the program output, while ϵ_j represents the measurement error for each indicator. The item selection results for each variable were analyzed using CFA. The testing process consisted of several stages. The self-efficacy scale comprised nine stages, which are as follows:

1. Stage 1: Initial Model

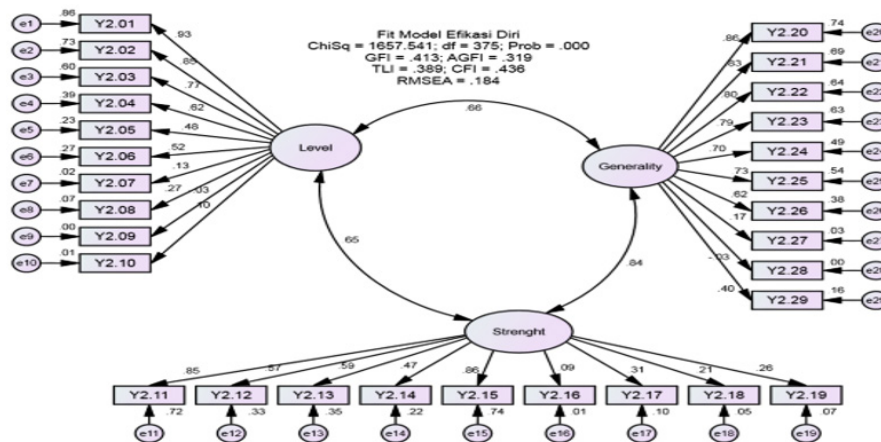


Figure 1. Initial CFA Model with 29 items on three dimensions of teacher efficacy

Figure 1 represents the first stage, in which all items within each dimension were still included. The first dimension, level, consisted of ten items with loading factors ranging from 0.03 to 0.93. The second dimension, strength, comprised nine items with loading factors between 0.09 and 0.85. Lastly, the third dimension, generality, contained ten items with loading factors ranging from 0.03 to 0.86. To obtain higher loading factors, the second stage was conducted by eliminating items that had low factor loadings.

2. Stage 2: Excluded Low-Factor Loadings < 0,5

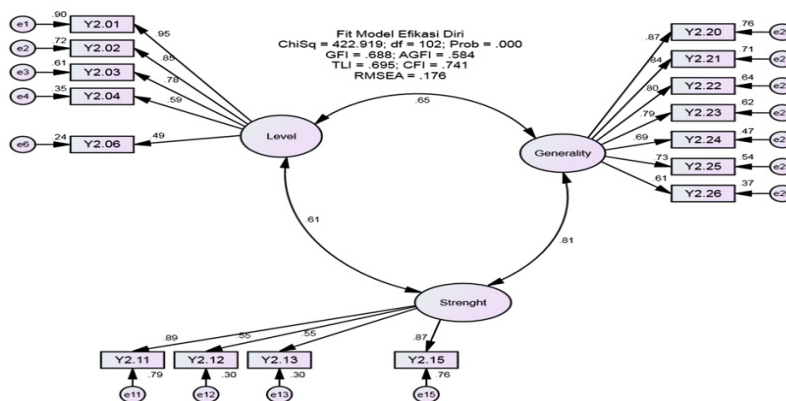


Figure 2. CFA model after excluding items with loading factor < 0.50 (Stage 2)

Figure 2 represents the second stage of the self-efficacy variable, showing the results after correcting for low factor loadings. The model yielded $\chi^2 = 422.919$; $df = 102$; $Prob = .000$; $GFI = .688$; $AGFI = .584$; $TLI = .695$; $CFI = .741$; and $RMSEA = .176$, indicating that further refinement was required to achieve acceptable model fit. Consequently, a third stage was conducted, during which items that did not meet the specified criteria were removed.

3. Stage 3: Further Excluded Low-Factor Loadings < 0,5

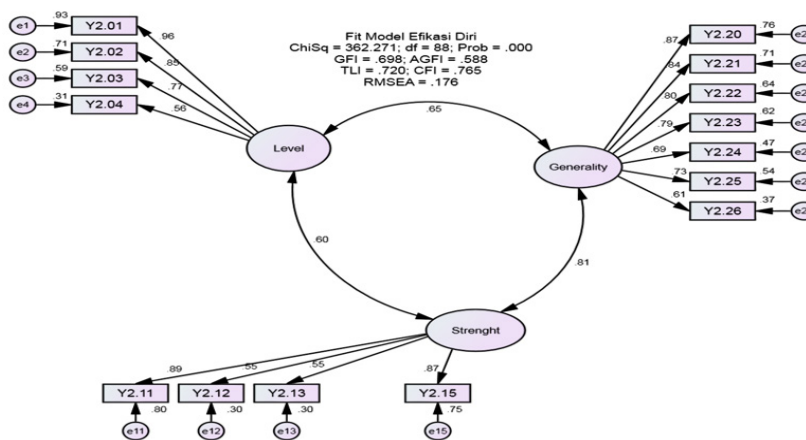


Figure 3. CFA model after excluding further items with low factor loadings (Stage 3)

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Figure 3 represents the third stage of the self-efficacy variable, showing the results after correcting for low factor loadings. The model yielded $\text{ChiSq} = 362.271$; $\text{df} = 88$; $\text{Prob} = .000$; $\text{GFI} = .698$; $\text{AGFI} = .588$; $\text{TLI} = .720$; $\text{CFI} = .765$; and $\text{RMSEA} = .176$, indicating that further refinement was necessary to meet model fit requirements. Consequently, a fourth stage was conducted, during which items that did not meet the established criteria were removed.

4. Stage 4: Std. Cov. Residual > 2,0 and modification indices (mi)

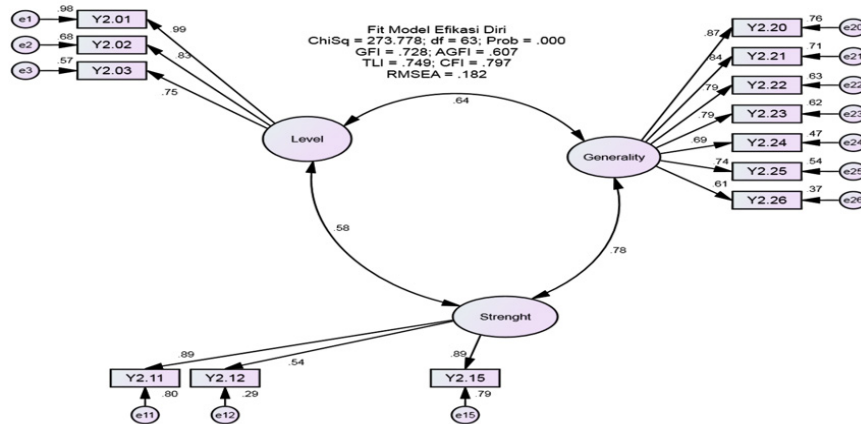


Figure 4. CFA model after improvement based on standardized residual covariance and modification indices (Stage 4)

Figure 4 represents the fourth stage of the self-efficacy variable, showing the results after correcting for low factor loadings. The model yielded $\text{ChiSq} = 273.778$; $\text{df} = 63$; $\text{Prob} = .000$; $\text{GFI} = .728$; $\text{AGFI} = .607$; $\text{TLI} = .749$; $\text{CFI} = .797$; and $\text{RMSEA} = .182$, indicating that further refinement was required to achieve acceptable model fit. Consequently, a fifth stage was conducted, during which items that did not meet the established criteria were removed.

5. Stage 5: Std. Cov. Residual > 2,0 and modification indices (mi)

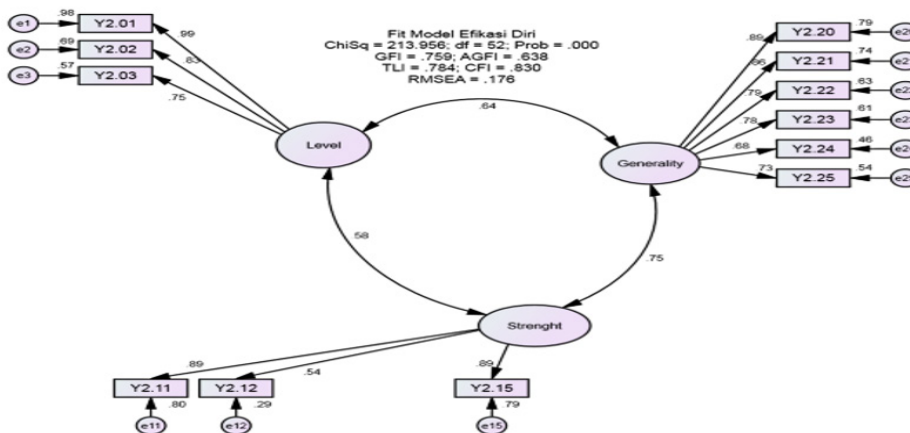


Figure 5. CFA model after additional elimination based on residual covariance and MI (Stage 5)

Figure 5 represents the fifth stage of the self-efficacy variable, showing the results after correcting for low factor loadings. The model yielded $\text{ChiSq} = 213.956$; $\text{df} = 52$; $\text{Prob} = .000$; $\text{GFI} = .759$; $\text{AGFI} = .638$; $\text{TLI} = .784$; $\text{CFI} = .830$; and $\text{RMSEA} = .176$, indicating that further refinement was necessary to achieve acceptable model fit. Consequently, a sixth stage was conducted, during which items that did not meet the established criteria were removed.

6. Stage 6: Std. Cov. Residual > 2,0 and modification indices (mi)

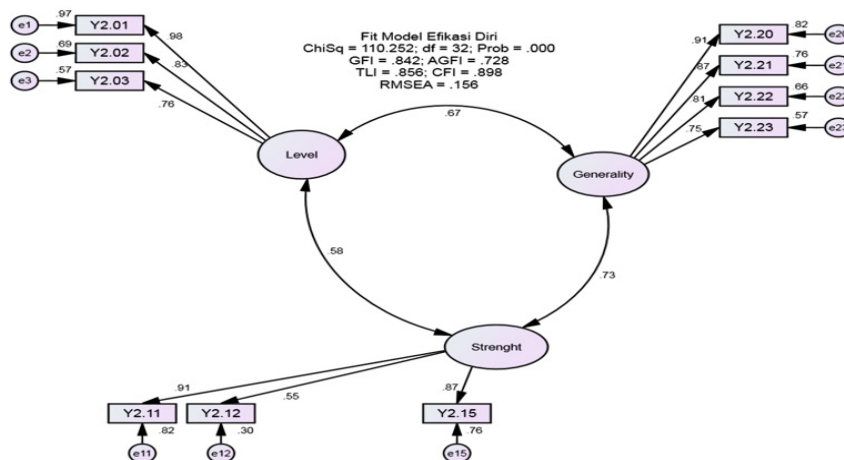


Figure 6. CFA model with further refinement, showing improvement in model fit index (Stage 6)

Figure 6 represents the sixth stage of the self-efficacy variable, showing the results after correcting for low factor loadings. The model yielded $\text{ChiSq} = 110.252$; $\text{df} = 32$; $\text{Prob} = .000$; $\text{GFI} = .842$; $\text{AGFI} = .728$; $\text{TLI} = .856$; $\text{CFI} = .898$; and $\text{RMSEA} = .156$, indicating that further refinement was required to achieve acceptable model fit. Consequently, a seventh stage was conducted, during which items that did not meet the established criteria were removed.

7. Stage 7: Std. Cov. Residual > 2,0 and modification indices (mi)

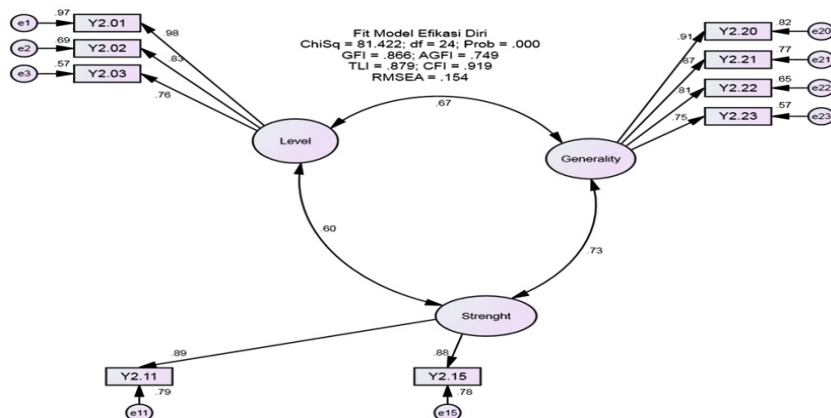


Figure 7. CFA model with remaining items all having factor loadings > 0.70 (Stage 7)

Figure 7 represents the seventh stage of the self-efficacy variable, in which each aspect was selected with loading factors above 0.70. The model yielded $\text{ChiSq} = 81.422$; $\text{df} = 24$; $\text{Prob} = .000$; $\text{GFI} = .866$; $\text{AGFI} = .749$; $\text{TLI} = .879$; $\text{CFI} = .919$; and $\text{RMSEA} = .154$. However, further refinement was still required to achieve acceptable model fit. Consequently, an eighth stage was conducted, during which items that did not meet the established criteria were removed.

8. Stage 8: Std. Cov. Residual > 2,0 and modification indices (mi)

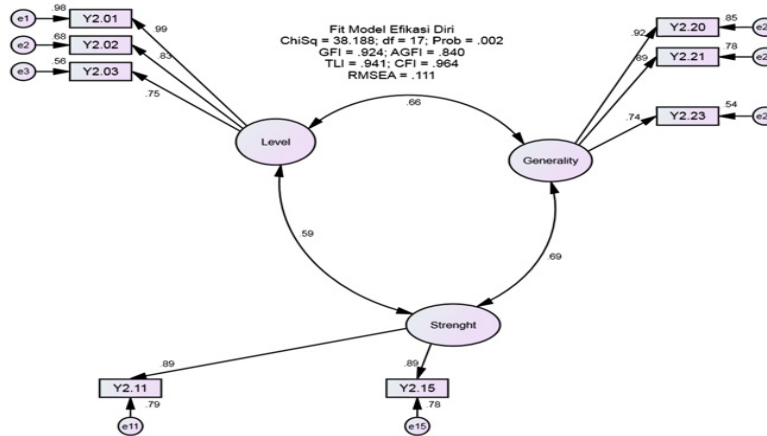


Figure 8. CFA model after additional modifications, fit index further improved (Stage 8)

Figure 8 represents the eighth stage of the self-efficacy variable, in which each aspect was selected with loading factors above 0.70. The model yielded $\text{ChiSq} = 38.188$; $\text{df} = 17$; $\text{Prob} = .002$; $\text{GFI} = .924$; $\text{AGFI} = .840$; $\text{TLI} = .941$; $\text{CFI} = .964$; and $\text{RMSEA} = .111$. However, a ninth stage was still required to achieve acceptable model fit.

9. Stage 9 Model with Fit Items

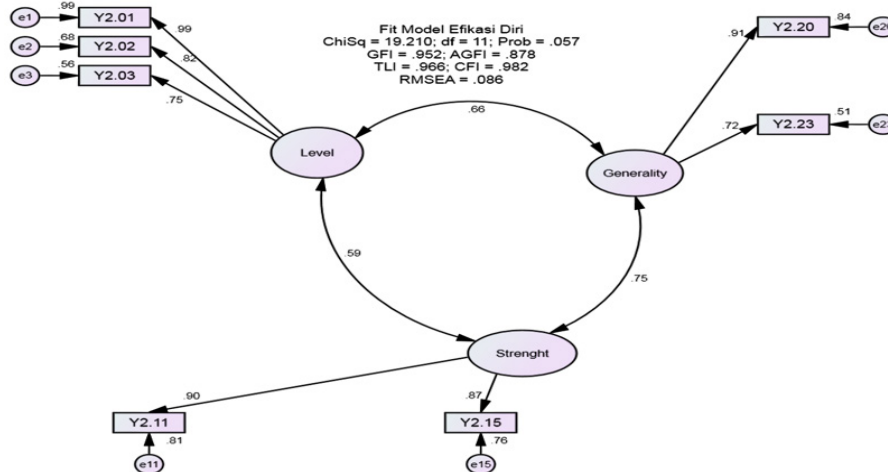


Figure 9. Final CFA model with seven valid items and fit indices that meet the criteria (Stage 9)

Figure 9 represents the final stage of item selection, which was conducted over nine stages based on loading factors, standardized residual covariance, and modification indices. The final CFA model (Figure 3.7) retained seven items, all of which had loading factors greater than 0.50. The model fit evaluation results, with chi-square = 19.210 ($p = 0.057$), GFI = 0.952, AGFI = 0.878, CFI = 0.982, TLI = 0.966, and RMSEA = 0.086, indicated a good level of goodness of fit.

The seven remaining items consisted of three items in the level dimension, reflecting teachers' confidence in handling difficult tasks such as mastering new material and explaining complex topics to students. Two items in the strength dimension demonstrated teachers' perseverance in facing obstacles and their consistency in completing tasks. Meanwhile, two items in the generality dimension illustrated teachers' belief that their abilities could be applied in broader contexts, including social interactions with students. These findings indicate that although the number of items was reduced, the three core dimensions of self-efficacy remained well represented.

Table 2. Reliability Results of the Self-Efficacy Scale Construct

SELF-EFFICACY							
Aspects	Selected Items	Loading Factor (λ)	Squared Loading Factor (λ^2)	Error Variance (ϵ)	Average Variance Extracted	Composite Reliability	Alpha Cronbach
Level	Item 01	0,990	0,980	0,020			
	Item 02	0,820	0,672	0,328			
	Item 03	0,750	0,563	0,438			
Strength	Item 11	0,900	0,810	0,190			
	Item 15	0,870	0,757	0,243			
Generality	Item 20	0,910	0,828	0,172			
	Item 23	0,720	0,518	0,482			
Dimension		5,960	5,128	1,872	0,733	0,950	0,888

The final item selection for each scale showed loading factors greater than 0.50, indicating good reliability, with the Average Variance Extracted (AVE) exceeding 0.50 and the Composite Reliability (CR) greater than 0.70. Furthermore, the reliability coefficient (Cronbach's alpha) for the teacher efficacy scale was 0.888.

Compared to the Teachers' Sense of Efficacy Scale (TSES) by Tschannen-Moran & Hoy (2007), this scale is more concise but still covers the fundamental aspects of teacher efficacy. The difference is that the TSES emphasizes dimensions of classroom management, instructional strategies, and student engagement, while the scale developed in this study focuses more on the ability to cope with adversity, persistence, and confidence across situations. The

advantage of this scale lies in its adaptation to the Indonesian educational context, making it more relevant to the conditions of elementary school teachers.

Table 3. Self-Efficacy Scale Reliability Test Results

Cronbach's Alpha	N of Items
.888	7

Based on the statistical analysis above, the blueprint for the teacher efficacy measurement tool is re-formulated as follows:

Table 4. Self-Efficacy Scale After Tryout

No	Aspects	Indicators	Items		TOTAL
			F	UF	
1	Level	Able to perform difficult tasks, including dealing with stressors	1,2,3		3
2	Strength	Persistent and not easily swayed by unfavorable experiences	11, 15		2
3	Generality	Confident in one's abilities in a broader field	20, 23		2
TOTAL					7

There are seven remaining statements that meet the required validity and reliability requirements. The remaining statements or items are as follows:

Table 5. Statements Selected After Tryout

No	Statements
1	I am able to explain lesson material well.
2	I am able to master new lesson topics to explain to students the next day.
3	I can easily explain difficult lesson material in front of the class.
4	I can achieve the targets I set for this semester in teaching the material to students.
5	I can quickly find solutions to problems at school, even when faced with many obstacles.
6	I am able to overcome difficulties in carrying out my duties as a teacher.
7	I am confident that I can be a "friend" to students both inside and outside the classroom.

All items are favorable and arranged into four response options: "Strongly Agree" (SS) scored as 4, "Agree" (S) scored as 3, "Rarely" (J) scored as 2, and "Never" (TP) scored as 1. This instrument can be used to assess how confident teachers feel in the classroom and how elementary school teachers believe in their ability to manage classroom functions that sometimes involve emotional regulation. According to Purna (2020), self-efficacy affects teachers' emotional regulation. Lightsey et al. (2011) found that self-efficacy influences emotional regulation, where higher self-efficacy helps individuals control negative emotions.

Teachers with high self-efficacy tend to show greater confidence and less anxiety when dealing with students. Emotional responses can be evaluated when teachers believe in their ability to do so, aiming to improve the effectiveness of the teaching and learning process. Self-efficacy itself plays a role in helping individuals adapt to social demands and situations by motivating them to set higher goals, invest more effort, and persist in the face of difficulties (Bandura, 1997). Specific domains of self-efficacy also form the foundation for successful emotional regulation (G.V. Caprara & Gerbino, 2001; Gian Vittorio Caprara et al., 2008).

This study has several limitations. First, the sample size is relatively small (N = 102), whereas the literature recommends a larger sample for CFA. Second, external validity has not been tested, so the relationship between teacher efficacy and other variables such as teaching performance, emotional regulation, or job satisfaction still needs further investigation. Third, the generalizability of the results is limited to elementary school teachers in Padang City. Therefore, future research is recommended to use a larger and more diverse sample, test external validity, and compare the scale with international instruments to strengthen its psychometric properties.

4. CONCLUSION

This study produced the Elementary School Teacher Efficacy Scale within the Indonesian context, consisting of seven statement items that meet psychometric validity and reliability criteria. The instrument is deemed suitable for measuring teachers' confidence in their ability to perform teaching tasks effectively. These findings have implications for the development of educational psychology, particularly in providing a concise, contextual, and culturally relevant teacher efficacy measurement tool in Indonesia. Furthermore, it can serve as a foundation for efforts to enhance teacher competence and professionalism through efficacy-based interventions and training programs.

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