



Measuring the Grit Scale for Teachers of Children With Special Needs in Indonesia

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Abstract. Grit is the ability of individuals to exhibit commitment, persistence in effort, as well as passion to attain long-term objectives. The research on grit in Indonesia has remained limited to students, and the investigation among teachers was popularized by Baraquia (2020). This aligns with the emergence of performance appraisal systems for teachers in the Philippines to support the continuous development of the teaching profession. Therefore, this research aimed to measure the validation of the Teacher's Grit Scale (TGS) in the Indonesian version. The adaptation process was carried out following the guidelines from the International Test Commission (ITC) using the Confirming Factor Analysis (CFA) method. CFA is the most reliable analytical method so far in testing the construct validity of a measurement tool in the fields of psychology, education, and social sciences. Data were collected from 301 teachers of children with special needs (CSN) selected by accidental sampling based on CFA test analysis using JASP. The results showed that the model fulfilled the criteria for fit, namely RMSEA .076, CFI .929, TLI .913, RNI .929, GFI .995, and SRMR .049. Therefore, TGS-Indonesia was valid and reliable for measuring grit in CSN teachers, and the discussion and implications were presented in the subsequent research.

Keywords: Confirmatory Factor Analysis, grit, Teacher's Grit Scale, teachers of children with special needs

Mengukur Skala Grit untuk Guru Anak Berkebutuhan Khusus di Indonesia

Abstrak. Grit adalah kemampuan individu untuk memiliki komitmen dan bertahan dalam usaha dan semangat untuk mencapai tujuan jangka panjang. Sampai saat ini penelitian tentang grit di Indonesia masih terbatas pada kalangan pelajar dan mahasiswa. Penelitian tentang grit pada guru dipopulerkan oleh Baraquia (2020), sejalan dengan munculnya sistem penilaian kinerja guru di Filipina untuk mendukung pengembangan profesi guru yang berkelanjutan. Penelitian ini bertujuan untuk mengukur validasi Teacher's Grit Scale (TGS) dalam versi Indonesia. Proses adaptasi dilakukan mengikuti pedoman dari International Test Commission (ITC) dengan menggunakan metode Confirming Factor Analysis (CFA). CFA merupakan metode analisis yang paling handal sejauh ini dalam menguji validitas konstruk suatu alat ukur dalam bidang

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psikologi, pendidikan dan ilmu sosial pada umumnya. Data dikumpulkan dari 301 guru Anak Berkebutuhan Khusus (ABK) di Indonesia yang dipilih secara *accidental sampling* berdasarkan analisis uji CFA menggunakan JASP. Hasil uji fit model menunjukkan kriteria fit model (RMSEA .076, CFI .929, TLI .913, RNI .929, GFI .995, dan SRMR .049). Dengan demikian dapat disimpulkan bahwa TGS-Indonesia valid dan reliabel untuk mengukur grit guru ABK di Indonesia. Pembahasan dan implikasinya dipaparkan dalam artikel.

Kata Kunci: *Confirmatory Factor Analysis*, grit, guru Anak Berkebutuhan Khusus, Teacher's Grit Scale

Teaching in Special School (SS) or inclusive schools presents a formidable challenge since the concept demands the capacity to effectively engage and guide students with diverse learning disabilities. Each student encounters unique obstacles, necessitating a tailored and individualized approach from teachers. In the learning process, students with disabilities, also known as Children with Special Needs (CSN), benefit greatly from repetition and consistent methods to foster their optimal development (Martin, 2016). In addition to the challenges in supporting CSN students, teachers in SS and inclusive schools also face the burden of school and class administration, as well as creating teaching journals, lesson plans, and syllabi (Rizky & Fasikhah, 2019). Therefore, the teaching profession requires commitment and effort to endure the job challenges (Argon & Kaya, 2018).

The ability to maintain commitment, perseverance, effort, and long-term interest in goals is known as the grit concept introduced by Duckworth and Quinn (2009). Specifically, Duckworth and Quinn (2009) explained that grit is related to a person's ability to sustain effort and interest in a task over a long period.

People with high grit levels will not deviate from their goals, even without positive feedback while working on their tasks.

Various analyses have shown that the grit level possessed by teachers contributes to students' performance and more effective learning processes (Argon & Kaya, 2018; Fabelico & Afalla, 2020). Teachers with high grit tend to be more tenacious and consistent in achieving desired educational goals. They are also more patient and capable of overcoming obstacles and challenges in teaching. Therefore, having high grit can improve the effectiveness of teaching and the quality of education.

Grit has attracted the attention of research in various countries considering the importance of the concept on education. Previous investigations used a valid and reliable measurement tool known as the Grit Scale, developed by Duckworth et al. (2007). Subsequently, this measurement tool was examined by Duckworth and Quinn (2009) to produce the Short Grit Scale (Grit-S). The grit measurement tool developed by Duckworth consists of two dimensions, namely consistency of interest, which includes the ability to maintain interest and focus on set

goals, and perseverance of effort to sustain determination in achieving set goals. Similarly, Sturman and Zappala-Piemme (2017) developed the Grit Scale for Children and Adults (GSCA). Existing measurement tools have been used for respondents ranging from children to adults.

Grit research has developed in other countries but not in Indonesia which has been limited to student subjects (Justine & Theresia, 2019; Muhibbin & Wulandari, 2021; Oktaviana, 2018; Purba & Djaling, 2019; Sari & Royanto, 2019; Vivekananda, 2018; Wahidah & Herdian, 2021; Wahidah & Royanto, 2019). After searching for related literature on the measurement for teachers, this research found a tool specifically developed for teachers by Baraquia in 2020. Teachers with high grit levels persist in their profession despite facing heavy pressures (Baraquia, 2020).

The grit measurement tool developed by Baraquia (2020) is known as the Teachers Grit Scale (TGS). This tool was developed based on Duckworth and Quinn (2009) grit theory. The TGS is intended to assist teachers in improving their perspectives, attitudes, and overall performance. The TGS consists of 14 items that show two aspects, namely perseverance in teaching, as well as passion and purpose. The aspect of perseverance, emphasizes the effort, energy, and enthusiasm of teachers, even when facing difficulties. This shows the determination, mental resilience, and composure of teachers in meeting the demands

of their work. Teachers with high levels of grit face teaching challenges by striving to give their best and maintaining a positive mindset. Furthermore, the aspect of passion and purpose in teaching reflects the joy and satisfaction experienced in teaching. This includes the satisfaction derived from the teaching profession and the sense of purpose in serving students (Baraquia, 2020).

The TGS has been tested on 1425 teachers in the Philippines, showing that the 14 items measuring the two aspects of grit have an adequate model fit ($\chi^2/df = 2.67; p < .001$; Comparative Fit Index (CFI) = .95; Tucker-Lewis Index (TLI) = .94; Goodness of Fit (GFI) = .95; Root Mean Square Error of Approximation (RMSEA) = .06; Standardized Root Mean Square Residual (SRMR) = .04). Furthermore, the factor loading values of the 14 items range from .538 to .798, indicating that all constructs correlate strongly with their factors. The reliability test results of the TGS also show adequate results, with a Cronbach's alpha value of .82. Considering the evidence of validity and reliability of the TGS developed by Baraquia (2020), the research is confident in adapting the measurement tool to the population of CSN teachers in Indonesia.

Based on the above explanation, the TGS should be tested to assess the level of grit in the population of CSN teachers, involving the dimensions of perseverance in teaching as well as the passion and purpose.

Method

Participants

The subjects were 301 CSN teachers, consisting of 71 (23.6%) and 230 (76.4%) from special and inclusive schools, obtained through incidental sampling techniques. Furthermore, the subjects included CSN teachers from various levels, namely Elementary, Junior High, and Senior High

Schools with 154 (51.2%), 125 (41.5%), and 22 (7.3%) subjects, respectively. The demographic profile of other subjects showed that the majority of teachers were female, totaling 225 (74.8%), non-civil servant (Non-PNS) 264 (87.7%), age group 26-35 years 153 (50.4%), and their highest education level is a bachelor's degree (S1) 289 (96%). The detailed demographic profile of the subjects can be seen in Table 1.

Table 1

Demographic Profile of Subjects

Demographic Variables	<i>n</i>	%
Gender		
Male	76	25.249
Female	225	74.751
Teacher Status		
Non-Civil Servant	264	87.708
Civil Servant	37	12.292
Type of School		
Inclusive School	230	76.412
Special School	37	23.588
School Level		
Elementary School	154	51.163
Junior High School	125	41.528
Senior High School	22	7.309
Age		
< 25 years old	53	17.608
26 - 35 years old	153	50.381
36 - 45 years old	48	15.947
45 years old	47	15.615
Highest Education		
Senior High School	5	1.661
Diploma	6	1.993
Bachelor's Degree (S1)	289	96.013
Master's Degree (S2)	1	0.332

Note. N = 301

Instrument

The measurement tool adapted in this research was the TGS developed by Baraquia (2020). Table 2 explained that the TGS consisted of 14 items representing two main

dimensions, namely perseverance in teaching, as well as passion and purpose. The perseverance dimension, which comprised 8 items, described a teacher's determination and ability to endure challenges in teaching and

overcome job demands. An example of one TGS item in the perseverance dimension was “I handle teaching challenges by seeking different solutions.” The passion and purpose dimension, consisting of 6 items, depicted a

person’s feelings and interest in duties and responsibilities as a teacher. An example of one TGS item in the passion and purpose dimension was “I manifest joy in my teaching profession for a long time.”

Table 2

Blueprint Teacher Grit Scale

Dimension	Item	<i>n</i>
Perseverance in Teaching	1,2,3,4,5,6,7,8	8
Passion and Purpose in Teaching	9,10,11,12,13,14	6

Note. N = 14

The participants were presented with several statements and asked to select the response that best fits their situation. The response options ranged from 5 (strongly agree) to 1 (strongly disagree).

Procedure

The process of adapting and translating the English version of the TGS measurement tool into Indonesian involved several stages. The first stage was the translation of the measurement tool into Indonesian, and then the translation was discussed to determine the

synthesis results. Subsequently, the synthesis results were translated back into English and were discussed by experts to analyze the equivalence between the items. The translated items were piloted with participants, namely teachers in special and inclusive schools. Table 3 explained the results of the TGS reliability test, with a Cronbach’s alpha value of .903, indicating that the measurement tool had good reliability, or the TGS was considered consistent. According to Periantalo (2015), reliability was considered satisfactory when Cronbach’s alpha value was $e^{.70}$.

Table 3

Reliability of the Teacher Grit Scale

Estimate	α
Point estimate	.903

In Table 4, the results of the item-total correlation for each TGS item showed values ranging from .514 to .698, hence all items were acceptable. According to

Periantalo (2015), items with an item-rest correlation value $> .300$ were considered significant (accepted) and used as research instruments.

Table 4*Validity of Teacher Grit Scale (TGS)*

Dimension	Item	Item-rest correlation
Perseverance in Teaching	G1	.545
	G2	.572
	G3	.520
	G4	.628
	G5	.542
	G6	.675
	G7	.658
	G8	.639
Passion and Purpose in Teaching	G9	.514
	G10	.593
	G11	.654
	G12	.657
	G13	.648
	G14	.698

Note. All item had item-rest correlation value greater than .30 and were considered significant

The following step was to perform data analysis using Confirmatory Factor Analysis (CFA) on the TGS. CFA analysis was used to examine the model fit of grit measurement in teachers. The research was conducted by First Order CFA on perseverance in teaching and passion and purpose in teaching dimensions. The model was considered fit when it met several requirements, including $RMSEA < .08$, $GFI/CFI/TLI/RNI \geq .90$, and $SRMR < .10$, as proposed by Matsunaga (2010).

Results

Descriptive statistics

The descriptive analysis of the variables in Table 5 showed that the empirical minimum, maximum, mean, and standard deviation values were 14, 70, 56.555, and 5.523 for all TGS items based on responses from 301 subjects. For each item, higher scores (1-5) indicated stronger agreement with the statement. The overall grit score was obtained by summing individual responses to all items. Meanwhile, a higher overall grit score reflected greater resilience in facing difficulties.

Table 5

Descriptive of the Grit Variable

Descriptive Statistics	Min	Max	M	SD
Hypothetical	14	70	42	9.3333
Empirical	14	70	56.555	5.523

Confirmatory Factor Analysis (CFA)

The CFA approach was selected to examine whether the data from the grit measurement tool aligned with the original theory developed by Baraquia (2020), including perseverance in teaching and

passion as well as the purpose. The CFA results on the ARS-Indonesia can be seen in Table 6, indicating that the TGS has a fit model (RMSEA .076, CFI .929, TLI .913, RNI .929, GFI .995, and SRMR .049), as shown in Figure 1.

Table 6

Goodness of Fit model ARS-Indonesia

Goodness of Fit Index	Value
Root Mean Square Error of Approximation (RMSEA)	.076
Comparative Fit Index (CFI)	.929
Tucker-Lewis Index (TLI)	.913
Relative Noncentrality Index (RNI)	.929
Goodness of Fit (GFI)	.995
Standardized Root Mean Square Residual (SRMR)	.049

Figure 1

Results of the Grit Model Test on Teachers

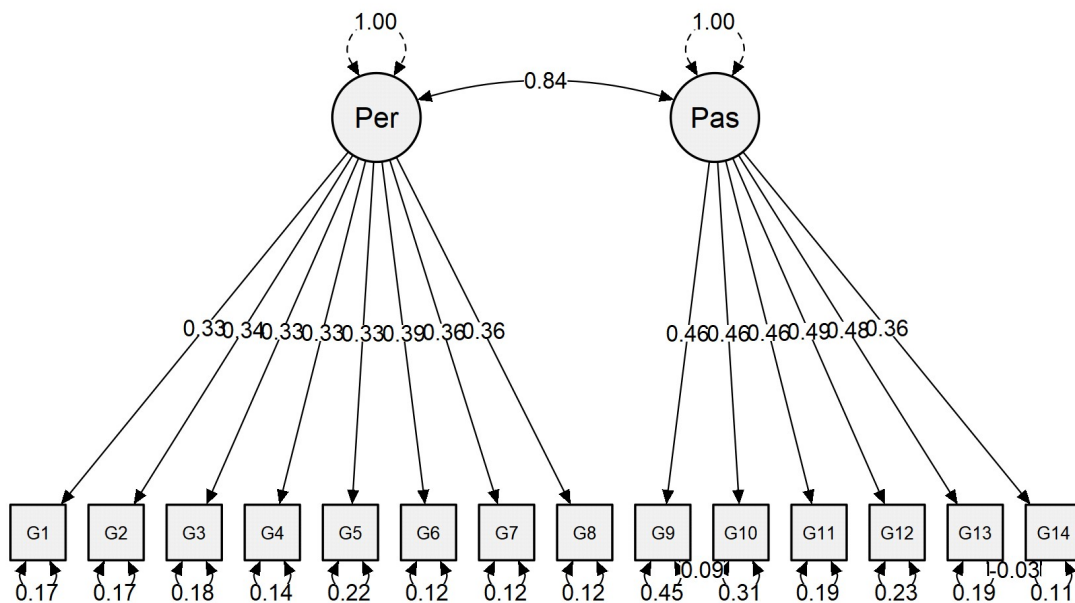


Table 7*Factor Loadings of Teacher Grit Scale (TGS)*

Dimensions	Item	Estimate
Perseverance in Teaching	G1	.329
	G2	.338
	G3	.328
	G4	.333
	G5	.330
	G6	.394
	G7	.364
	G8	.359
Passion and Purpose in Teaching	G9	.462
	G10	.459
	G11	.461
	G12	.493
	G13	.484
	G14	.364

Note. All item had factor loading value greater than .30 and were considered significant

After obtaining a fit model, the next step was to test the significance of each item on each factor. Table 7 showed the factor loadings of each TGS item indicating that all items are significant ($e".30$). Items G1, G2, G3, G4, G5, G6, G7, and G8 in the perseverance of the teaching dimension had factor loading values ranging from .328 to .394. Furthermore, G9, G10, G11, G12, G13, and G14 in the passion and purpose had factor loading values ranging from .364 to .493. These values mean that both the items and dimensions have good validity. Therefore, the findings show that all items were valid and could be used to measure the grit construct.

Discussion

The results show that the TGS is valid and reliable for testing the teachers of children with special needs (CSN) in Indonesia. The perseverance in teaching dimension is measured with G1, G2, G3, G4, G5, G6, G7, and

G8 items, while passion and purpose is measured with G9, G10, G11, G12, G13, and G14. The TGS, with a reliability level of .903, has proven to be reliable since it exceeds the minimum Cronbach's alpha value of $e".70$. Therefore, the concept can be used to measure grit in the population of CSN teachers in Indonesia. These findings are consistent with Baraquia (2020), where the grit variable consists of two dimensions, namely perseverance in teaching as well as passion and purpose. Meanwhile, the two dimensions show adequate internal consistency and correlation.

Investigating and studying the grit construct at present helps identify indicators for measuring grit in CSN teachers. This measurement tool can be a basis for developing policies or initiating development programs to strengthen teacher grit related to perseverance in teaching, enthusiasm, and purpose. This is based on Duckworth and Quinn (2009) that grit

causes individuals to work hard toward challenges as well as maintain perseverance and interest in difficult and failure-prone situations.

The limitation of this research is the uneven distribution of data because the subjects are CSN teachers in various special and inclusive school levels of elementary, junior high, and senior high schools. Furthermore, the distribution of data is needed for generalization as CSN teachers face different work pressures at each level. Future research is recommended to use a larger sample from a broader geographic coverage in Indonesia to enhance the generalization of CSN teacher grit.

Conclusion

In conclusion, this research was conducted to validate the adaptation of the grit measurement tool into the Indonesian version. Based on the CFA analysis, TGS-Indonesia consisted of two dimensions, namely perseverance and passion and purpose in teaching. Therefore, TGS-Indonesia was valid in measuring the latent construct of grit. The concept also fulfilled the criteria for convergent validity based on the calculation of construct reliability, which was considered good. This showed that the TGS-Indonesia (14 items) was proven to be valid and reliable in measuring grit in the population of CSN teachers.

The uneven distribution of data in this research affected generalization. Future analyses should be conducted using a larger sample and broader geographic coverage to

improve the generalization of results on the grit of CSN teachers in Indonesia.

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