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Adaptation of the Global Motivation Scale (GMS-28) In Indonesian Version

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Abstract

Motivation is one of the important variables for study, whereas many motivational studies have been conducted to predict learning, performance, and behavior change. The motivational scale that has gone through psychometric testing is required in motivational research to accurately describe the construct. There is still low availability of motivational scale in Indonesia that has passed the psychometric testing. Therefore, this study aims to adapt the Global Motivation Scale (GMS-28) into Indonesian. The adaptation process refers to the adaptation guidelines by the International Test Commission, where the process of adaptation also involves psychometric testing. Data collection was carried out using an online questionnaire on 383 participants aged 18-25 years. The psychometric test was carried out using internal consistency reliability and validity based on internal structure. The internal consistency scale has revealed all acceptable reliability coefficients aspects with a range of $a = 0.703 – 0.810$. Item analysis pointed out that all items have good item-total correlation and item mean. Findings from First-order Confirmatory Factor Analysis showed that all aspects have acceptable model fit and all of the items significantly measures the aspects on GMS-28. Based on these results, it can be concluded that the Indonesian version of the GMS-28 is suitable for use for further studies. However, further testing needs to be done using a larger sample to be used in all Indonesian populations.

Keywords: Global Motivation Scale; Adaptation Scale; Psychometric Testing; Motivation Scale.

1. Introduction

1.1. Background

Studies related to human behavior have never stopped to be concerned until current condition. Human reality is so complex that requires multidimensional explanations to explain the range of possible behaviors. One of the behavior predictors that is quite often discussed is motivation. Education, Industry and Organization are some of the research areas that often involve motivation to predict student and employee performance (see Georgescu, Dumitrache & Joita, 2020; Jolliff & Strubler, 2021). Other than that(GEORGESCU *et al.*, (2020), ; Jolliff & Strubler (2021). In addition, motivation is also often associated with some variables in predicting *well-being* (see Olivares, Navarro, Sanchez-Verdeio & Muelas, 2020), resiliensi (see Mostafa & Lim, 2020; Whitfield &Wilby, 2021), *emotional intelligence* (see Ates & Buluc, 2015) and other psychological variables.

The development of motivation scale has been widely carried out in various countries, resulting in a variety of motivation scale based on various motivational theories and concepts. One of the theories that seeks to explain the concept of motivation is the theory of self-determination (SDT) by (Deci & Ryan, 1985). Its theory (1985) concerns in motivation from a multidimensional perspective that argues that human motivation is more than something that varies primarily in amount, but also varies in types of regulation and types of motivation. This theory focuses on the psychological level, where motivation is described as a continuum that reflects the type of behavioral regulation from non-self-determined (Deci & Ryan, 2000; 2017) to fully self-determined behavior. In self-determination theory, this types of regulation should be considered as a better predictor of human behavior rather than the high and low scores of motivation (Urbanaviciute *et al.*, 2013). Development of motivation scale using SDT as the grounded theory will be benifical, because a good motivation scale are able to provide more information rather than just the amount of motivation.

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One of the motivation scales that is developed based on self-determination theory is the Global Motivation Scale (GMS-28) by Guay *et al.* (2003). The GMS-28 measuring instrument was first developed in French by Guay, Blais, Vallerand, & Pelletier in 1999 and then followed by the English version in 2003. Motivation is defined as internal and/or external forces that produce the initiation, direction, intensity, and persistence of behavior (Vallerand, 2012). Individuals can be motivated because they value or hold a value to the activity, or because of a strong external impulse or coercion. The GMS-28 focuses on the basic concept of motivation that is the "*why*" a behavior is carried out (Vallerand, 1997). GMS-28 independently measures three types of motivation, namely intrinsic motivation, extrinsic motivation, and amotivation. This motivational difference reflects the degree to which the values and regulations of a behavior are internalized by the individual (Ryan & Deci, 2000b), where the more autonomous or self-determined the behavior produced, the more intrinsic the type of regulation of his behavior. Figure 1 shows the motivational continuum on GMS-28, adapted from the self-determination continum by Deci & Ryan (2000) and developed within the framework of the Hierarchical Model of Intrinsic and Extrinsic Motivation by Vallerand et al (1997).

Table 1. Motivation Continuum in the Global Motivation Scale (GMS-28)

Behaviour	*Nonself-Determined*	*Self-determined*					
Motivation	Amotivation	Extrinsic Motivation			Intrinsic Motivation		
Types of Regulation	*Non-Regulated*	*External Regulation*	*Introjected Regulation*	*Identified Regulation*	*Intrinsic Regulation*		
					IM to Accomplish	*IM to Know*	*IM to Experience Stimulation*

1.2. Intrinsic Motivation

Intrinsic motivation refers to engaging in an activity of self-interest and to feel the satisfaction or pleasure obtained from the activity (Guay, Mageau & Vallerand, 2003b; Vallerand, 1997). Vallerand (1989) and colleagues then propose three types of intrinsic motivation, namely (1) intrinsic motivation Click or tap here to enter text. - *to know* which is defined as the involving in activities to feel satisfaction derived from learning, exploring and understanding new things, (2) intrinsic motivation - *to accomplish* which refers involving in activites because of the pleasure and satisfaction derived from trying to surpass one own's abilites, creating and or accomplish something, and (3) intrinsic motivation – *to experience stimulation* i.e. involving in activites to feel pleasent sensation of stimulation, which is related to the activity (Cadwallader, Jarvis, Bitner & Otnom, 2010; Urbanaviciute et al., 2013; Vallerand, 1997, 2007)

1.3. Extrinsic Motivation

Extrinsic motivation refers to the involvement of the individual in an activity as a means to achieve an end and not for one's own interests (Guay *et al.*, 2003b; Vallerand *et al.*, 1989). Extrinsic motivation in GMS-28 is divided into four types, where the difference is based on the concept of *autonomy-control*, this difference is based on the concept of *autonomy-control,* which refers to the degree that behavior is the desire of the individual himself (*autonomy)* or the internal or external pressure and/or compulsion to do something (*control*). Highest level of *control* is called (1) *Extrinsic motivation – external regulation*, reflecting behaviors that are regulated through external factors to meet external demands or rewards. Furthermore, (2) extrinsic motivation – *introjected regulation,* represents a partial internalization by which the individual begins to internalize the reasons for their behavior (Vallerand, 1997) but is not fully integrated in an individual itself (Ryan & Deci, 2000a). The behaviors resulting from introjected regulation are usually carried out only to avoid guilt or anxiety, or to maintain the ego and dignity of the individual. Last, (3) extrinsic motivation – *identified regulation* is the process by which the individual consciously identifies and receives the value of an activity (Ryan & Deci, 2000a, 2020). The behavior resulting from that identified regulation will be more towards *autonomy*, although it is still included in the extrinsic motivation because the reason the activity is carried out unlike intrinsic motivation i.e. solely to derive pleasure from the activity but rather because the individual considers that the principle or value of the activity is important (Treuren *et al.*, 2017) even if it's not pleasant in itself (Urbanaviciute *et al.*, 2013) (Deci & Ryan, 2000) (Deci & Ryan, 2020) (Ryan, R. M., & Deci, 2017) (Vallerand *et al.*, 1989).

1.4. Amotivation

Amotivation indicates lack of intentionality. Thus, it refers to the absence of motivation (intrinsic as well as estrinric). Amotivation arises when the individual does not see the value of an activity, does not feel competent to carry out the activity or does not expect any results of the activity. This forms a state in which the individual becomes passive, lack of intention or purpose to behave (Guay *et al.*, 2003b) (Vallerand *et al.*, 1989) (Deci & Ryan, 2000) (Urbanaviciute *et al.*, 2013).

1.5. Problem Formulation

In general, the measurement of motivation using the GMS-28 is expected to provide comprehensive information related to motivation, where motivation is described in more depth in three types based on the internalization of individual behavior regulation in an activity. The intended use of GMS-28 is not limited to the researcher, educational practitioners, as well as industry and organizational practitioners, but also those who wants to understand more in-depth mechanisms related to the process and effects of motivation. In order to be used by researchers, practitioners and other relevant parties in Indonesia, GMS-28 needs to be adapted into Bahasa Indonesia in order to adjust the population of Indonesian society. Therefore, this study aims to adapt the Global Motivation Scale (GMS-28) into Bahasa Indonesian so that it can be used in the Indonesian population.

2. Research Method

2.1. Research Instruments

The instrument used is the Global-Motivation Scale (GMS-28) by Frédéric Guay, Geneviève A. Mageau and Robert J. Vallerand (2003a). GMS-28 consists of 28 items that contain a statement of the reasons why individuals perform several behaviors that reflect all these three types of motivation. The response options in GMS-28 used a 7-point scale ranging from 1 – *"Doesn't Correspond Accordingly"* to 7 – "*Correspond Completely*".

2.2. Adaptation Process

The adaptation process design of the GMS-28 includes a systematic efforts to adjust the components of the scale to reach an equivalence between both test formats (Iliescu, 2017). Thus, the adaptation process does not only involves language translation, but also the evidence of psychometric analysis or validation to ensure that the adaptation results of GMS-28 were equivalent to the original format of GMS-28.

The adaptation process started with the *pre-condition* stage, that is to obtain permission to use the scale from the test-makers via e-mail. The next stage was the *test-development.* It was carried out by translating the original format (in English) into translated format (Bahasa Indonesia) and make sure that the translation consider linguistic, psychological and cultural differences. The forward-backward translation was carried out to translate scale. In this process, two independent expert translators were used to translate the GMS-28 into Bahasa Indonesia. The results of the two translations were then reconciled by the researcher and discussed (proof-reading) with the translator. After getting one translation, one different expert translator then do the backwards translation into English. The translation format of the final GMS-28 measuring instrument then moved to the Readability Test process. After obtaining the final translation results, the items were compiled in the form of an online questionnaire to be distributed, so that they could proceed to the *confirmation* stage, namely data analysis to provide relevant evidence about the psychometric properties of the GMS-28 translated version.

2.3. Research Participants

The subjects in this study were 383 Indonesian citizens aged 18-25 years with diverse demographic backgrounds (Table 1). Method of sample selection or sampling technique used in this study was non-random sampling using *accidental sampling*. Participant data collection was carried out online using an online form.

Table 1. Data of Demographic Participants

No	Variable Categories	f	%	M	SD
Gender					
1	Man	101	26.4		
2	Woman	282	73.6		
Age					
1	18 – 19 Years Old	137	35.8	20.82	2.233
2	20 – 21 Years Old	109	28.5		
3	22 – 23 Years Old	66	17.2		
4	24 – 25 Years Old	71	18.5		
Final Education					
1	High School/Vocational/Equivalent	296	77.3		
2	D3/D4/S1/Equivalent	84	21.9		
3	S2/Equivalent	3	0.8		
	Total	**383**	**100**		

2.4. Data Analysis

Psychometric testing in this study used a classical test theory approach. The psychometric tests that carried out were reliability tests (internal consistency using *Cronbach's alpha*), and validity tests (based on internal structure using *First Order - Confirmatory Factor Analysis*).

3. Results and Discussions

3.1. Readability Test

Readability tests were carried out before data collection and psychometric testing, with the aim of ensuring that forward-backward translation results were easily understood by participants, and have a purpose that is in accordance with the measurement objectives. The readability test was conducted on 6 participants who matched the criteria of the study sample. Based on the results of the readability test, it can be stated that the entire item is quite clear and understandable to the participants. However, some respondents had difficulty understanding some of the terminology on some items (Table 2). An evaluation was then performed on the item to make it easier for the respondent to understand the statement on each item. Revisions were made not only to the 6 items, but also to some items that do not have ambiguous terms but considered to have less effective sentences arrangement. Thus, revisions were carried out by changing the word equivalent to the sentence structure of related items.

Table 2. Elusive Terminology in GMS-28

Items	Item Translation	Terminology		
		Translation	**Original**	**Substitute Word**
1	Untuk merasakan berbagai emosi yang menyenangkan.	Berbagai emosi	Emotions	Berbagai perasaan
3	Untuk membantu diri saya sendiri menjadi seseorang yang saya tuju.	Tuju	Aim to be	Inginkan
4	Karena saya suka membuat penemuan-penemuan yang menarik.	Penemuan-penemuan	Discoveries	Menemukan berbagai hal

Items	Item Translation	Terminology		
		Translation	Original	Substitute Word
8	Karena kesejahteraan yang saya rasakan saat melakukannya.	Kesejahteraan	Sense of well-being	Rasa bahagia
23	Untuk mencapai prestise.	Prestise	Prestige	Gengsi
24	Karena saya memilih untuk menginvestasikan diri saya pada hal-hal yang penting bagi saya.	Menginvestasikan	To invest	Terlibat

Psychometric tests were then carried out after data retrieval. The calculation of the motivation score from the GMS-28 was carried out independently on seven scores obtained from the seven aspects by summing the scores of each item in each aspect. Therefore, testing of the psychometric properties of items was carried out in each aspect. Table 3 shows the results of reliability tests on all seven aspects.

Table 3. Reliability test results on each aspect

	Motivational Aspects						
	IM-TK	**IM-TA**	**IM-ES**	**EM-ID**	**EM-INT**	**EM-ER**	**AMO**
Cronbach's Alpha	0.810	0.786	0.783	0.736	0.703	0.726	0.789

3.2. Reliability

The internal consistency coefficient was obtained from the relationship between scores derived from individual items or sub-sets of items in the test and all data obtained from a single administration. Internal consistency required to be done with the degree to which a set of items in a measuring instrument measures the same construct, evidenced by how well the variety of items is, or how the items correlate with each other (Litwin, 2011). One of the commonly used reliability coefficient of internal consistency is *Cronbach's Alpha*, which also being used in this study. *Cronbach's alpha* reliability coefficient (α) has a range of 0 to 1, where the higher the coefficient obtained, the higher the internal consistency is, and the lower the error in measurement. Table 3 shows the reliability of each dimension that ranges from 0.703 to 0.810. The value belongs to the category of good (α >0.700), referring to the category of Alpha coefficients according to Streiner (2003). It can be concluded that the all of the aspects of GMS-28 provides a reliable results.

Other information related to internal consistency in the GMS-28 can be done by conducting an analysis at the item level. Item analysis was carried out to evaluate scale based on the quality of each item to the relationship between each item and other items in order to improve the quality of items and scale. The item analysis was carried out by analyzing the value of Item-total Correlation, and Item Mean. Item-total Correlation or commonly called item discrimination is the correlation between the item's score and the total score of other items on the same scale or dimension. While the mean shows the average response on an item, which is also referred as an endorsement item.

Based on the results of the item analysis in Table 4, it is known that all items in the 7 motivational aspects have an item-total correlation value of r = 0.300 - 0.690, so that no item needs to be dropped and shows a good correlation of all items to the total score. The *mean* value reflects how difficult the item is approved by the participants. The response options on GMS-28 are in the range of 1 – 7 from '*Doesn't correspond accordingly'* to '*Correspond completely'*, where the mean value indicates the tendency of the participant's response to the item. A low mean value (1) indicates a tendency to a '*Doesn't correspond accordingly*' response by the participant and a high mean (7) indicates a tendency to a '*Correspond completely'* response by the participant. The mean values in Table 4 show that the mean items in each aspect vary in the range from 3.898 to 5.969. This shows that all items are neither difficult nor too easy for participants to approve.

Table 4. Item Analysis Results

	Motivational Aspects						
	IM-TK	**IM-TA**	**IM-ES**	**EM-ID**	**EM-INT**	**EM-ER**	**AMO**
Item-Total Correlation	0.562-0.690	0.553-0.628	0.532-0.654	0.467-0.603	0.414-0.548	0.300-0.623	0.468-0.685
Mean Items	5.820-5.958	5.674-5.807	5.621-5.749	5.681-5.969	3.473-4.658	5.266-5.582	3.898-4.603

3.3. Confirmatory Factor Analysis

CFA is used to provide confirmation estimates of measurement theory, which determines how logically and systematically measured variables represent latent constructs that cannot be measured directly (Hair JR *et al.*, 2007). The CFA analysis conducted in this study used first-order Confirmatory Factor Analysis where each aspect was analyzed separately to see whether the hypothesized measurement model was in accordance with the theory (*fit model*) by looking at the *fit indices*. *Chi-square* or χ^2 *goodness-of-fit statistics* are the most commonly used *fit indices*, by assessing the difference between samples and *fitted covariance* matrices (Vedsted *et al.*, 2008). But it has been criticized for its limitations in being sensitive to the number of samples whereas in large sample quantities, it tends to reject hypothesized models. Therefore, in this study, an evaluation of other *fit indices* was carried out to test the *fit model*, namely the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR) and the Comparative Fit Index (CFI). The *fit model* criterion or index refers to the criteria according to Hu & Bentler (1999).

3.3.1. Intrinsic Motivation – To Know

The results of the analysis on the aspect of *Intrinsic Motivation – To Know* (IM-TK) showed that the model was not fit with a value $\chi^2_{(2)}$= 9.162 , p = 0.010, *Comparative Fit Index* (CFI) = 0.986, Root mean square error of *approximation* (RMSEA) = 0.097, and *Standardized root mean square residual* (SRMR) = 0.024. So, it was necessary to make modifications to increase the *goodness* of fit value. Model modification was done by evaluate the Modification Indices (MI) value. MI is an estimation of the change or decrease in the value of *chi-square* (χ^2) by 1 degree of freedom, if the parameter remains into the model and is freely estimated. Evaluation of MI values is carried out to (Brown, 2015) with identifying measurement errors that correlate between two items, then modify these items by correlating between measurement errors until the goodness of fit indicator can be fulfilled.

Modifications was made to improve the goodness of fit index in the CFA model of the IM-TK aspect by correlating the measurement error of items 18 and 25. These two items have the highest MI values, with the item *"(Secara umum, saya melakukan berbagai hal ... untuk merasakan kepuasan saat saya mempelajari hal-hal baru yang menarik (18)"* dan "*... untuk kepuasan yang saya rasakan saat mempelajari beragam fakta menarik.(25)".* The correlation between *measurement errors* shows that there is a variance that is not estimated by latent variables in the research model (Brown, 2015). After modification, retesting was carried out on the IM-TK model and the results were obtained that the model was fit with $\chi^2_{(1)}$ = 0.436, p = 0.509, CFI = 1,000, RMSEA = 0.000, and SRMR = 0.005. These results suggest that the hypothesized model corresponds to the theory of measurement. Factor loadings (Table 5) of all four items in this aspect are acceptable >0.30 (p<0.001) which indicates that all items significantly measure the IM-TK aspect.

3.3.2. Intrinsic Motivation – To Accomplish

The results of the Confirmatory Factor Analysis (CFA) analysis on the *Intrinsic Motivation – To Accomplish* (IM-TA) aspect showed that the model was fit with $\chi^2_{(2)}$= 1,562, p>.05, CFI = 1,000, RMSEA = 0.000, and SRMR = 0.011. These results suggest that the hypothesized model corresponds to the theory of measurement. Factor loadings (Table 5) of all four items in this aspect are acceptable >0.30 (p<0.001) which indicates that all items significantly measure the IM-TA aspect.

3.3.3. Intrinsic Motivation – To Experience Stimulation

The results of the CFA analysis on the *aspect of Intrinsic Motivation – To Experience Stimulation* (IM-ES) showed that the model was fit with $\chi^2_{(2)}$= 4,077, p>.05, CFI = 0.995, RMSEA = 0.052, and SRMR = 0.017 . In addition, it can be seen in Table 5 that all items on IM-ES have a factor loading of >0.30 (p<0.001).

3.3.4. Extrinsic Motivation – Identified Regulation

The CFA test results on the EM-ID aspect showed that there were *fit indices* that did not meet the fit criteria with values $\chi^2_{(2)}$= 13,184, p = 0.001, CFI = 0.966, RMSEA = 0.121, and SRMR = 0.034. Modifications were made by correlating the measurement error of items 3 and 17 with the sound of the item *"(Secara umum, saya melakukan berbagai hal ... untuk membantu diri saya menjadi seseorang yang saya inginkan. (3)"* and *"... sebagai cara untuk mendapatkan apa yang saya inginkan (17)".* After modification, *a fit model* was obtained with $\chi^2_{(2)}$= 0.234, p = 0.628, CFI = 1,000, RMSEA = 0.000, and SRMR = 0.005. Based on Table 5, it is known that all items in the EM-ID aspect have a good factor loading (>0.30, p<0.001).

Table 5. Standardized Factor Loading on Each Aspect

Intrinsic Motivation – To Know				
Items	**λ**	***P-Value***	**Information**	**Number of Correlations**
4	0.652	<,001	Significant	-
11	0.841	<,001	Significant	-
18	0.634	<,001	Significant	1
25	0.703	<,001	Significant	1
Intrinsic Motivation – To Accomplish				
6	0.692	<,001	Significant	-
13	0.739	<,001	Significant	-
20	0.702	<,001	Significant	-
27	0.640	<,001	Significant	-
Intrinsic Motivation – To Experience Stimulation				
1	0.615	<,001	Significant	-
8	0.685	<,001	Significant	-
15	0.683	<,001	Significant	-
22	0.780	<,001	Significant	-
Extrinsic Motivation – Identified Regulation				
3	0.693	<,001	Significant	1
10	0.622	<,001	Significant	-
17	0.879	<,001	Significant	1
24	0.507	<,001	Significant	-
Extrinsic Motivation – Introjected Regulation				
5	0.700	<,001	Significant	-
12	0.727	<,001	Significant	-
19	0.374	<,001	Significant	1
26	0.545	<,001	Significant	1
Extrinsic Motivation – External Regulation				
2	0.361	<,001	Significant	-
9	0.577	<,001	Significant	1
16	0.651	<,001	Significant	1
23	0.860	<,001	Significant	-
Amotivation				
7	0.515	<,001	Significant	-
14	0.419	<,001	Significant	-
21	0.354	<,001	Significant	-
28	0.719	<,001	Significant	-

3.3.5. Extrinsic Motivation – Introjected Regulation

The CFA result on the EM-INT aspect showed that the model was not *fit* with $\chi^2_{(2)}$ = 28,631 , p = <,001, CFI = 0.907, RMSEA = 0.186, and SRMR = 0.057. Modifications were made by correlating the measurement errors of items 19 and 26, with the sound of the item *"(Secara umum, saya melakukan berbagai hal)...karena saya terpaksa melakukannya (19)"* and *"... karena saya akan merasa tidak enak hati jika tidak melakukannya (26)"*. The result of the modification shows that the model is fit with $\chi^2_{(1)}$ = 0.576, *p*>.05, CFI = 1,000, RMSEA = 0.000, and SRMR = 0.010. These results suggest that the hypothesized model corresponds to the theory of measurement. All items in the EM-INT aspect have a good factor loading (>0.30, p<0.001).

3.3.6. Amotivation

The amotivation (AMO) aspect has CFA analysis results that show a *fit* model with $\chi^2_{(2)}$ = 2.837, *p*>.05, CFI = 0.998, RMSEA = 0.033, and SRMR = 0.015. These results show that the measurement model corresponds to the theory of measurement. All items in this aspect also have a good factor loadings <0.30 (p<0.001) which can be seen in Table 5.

4. Conclusion

Based on psychometric tests that have been carried out on the Global Motivation Scale (GMS-28) translated through a forward-backward translation procedure, it can be concluded that it can be used for the Indonesian population. During psychometric testing, no items were dropped so the GMS-28 (Indonesia version) were remained with 28 items. The results of *internal consistency reliability testing* show that all aspects in GMS-28 (Indonesian version) have a good Alpha Cronbach coefficient with a range α = 0.703 – 0.810 enclosed in Table 4.2. In addition, item analysis based on *internal consistency* testing shows that correlations between items and total items across all aspects have a good correlation, indicating that all items measure the same construct. Based on this information, it can be concluded that the Indonesian version of the GMS-28 provides reliable results. The evidence of validity *based on internal structure* proves that the aspects in GMS-28 obtain *goodness of fit* criteria in CFA testing, with acceptable factor loadings on each item that are significant in measuring motivational aspects. These findings suggest that the adapted GMS-28 has good psychometric properties, based on the results of tests that have been carried out.

Participants involved in the adaptation of the GMS-28 measuring instrument have an age range of 18-25, so its use in the Indonesian population may be limited to that age range. Thus, the researcher wants to propose a suggestion based on the shortcomings of this study, that is to do further testing using a larger sample and a wider age range (adolescents to late adulthood, or the elderly).

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