Construct Validity in Research Development Instruments: The Analysis of Self-Discipline Factors

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Abstract: Self-discipline is the infinite capital in building a quality person to achieve success through the ability of individuals to delay satisfaction and self-control and self-regulate in an effort to develop one' potential. The dimensions of self-discipline cover the following things: (1) the ability to delay satisfaction; (2) the ability to control oneself; and (3) the ability to self-regulate. This research is a research development that aims to produce self-discipline measure instrument of learners who named self-discipline scale. Development of self-discipline scale is done in two stages that are: (a) prototyping phase, and (b) assessment phase. The findings of this study indicate the indicators that represent dimensions are: (1) the ability in delaying satisfaction is not delaying school work. Indicators that represent dimensions; (2) the ability to control oneself are able to impose themselves (positive things), able to control the impulse, and able to strengthen themselves (positive). While the indicators that represent dimensions are (3) the ability to self-manage is capable of making decisions, able to keep promises themselves, able to monitor themselves, and able to determine their own goals.

Keywords: Self Discipline, Postpone Satisfaction, Self-Control, Self-Regulation

I. INTRODUCTION

Bearing a qualified person requires such a capital, one of which is self-discipline. In the world of education, self-discipline is one of the main aspects for learners in an effort to develop their potential. Discipline should be viewed as a positive and constructive force that refers to an awareness that begins with obedience to the prevailing rules and sets the tack to bring the desired and important thing to it (Taylor, 1987; Kohlberg, 1991, Parker, 2006; Kohn, 2008). Self-discipline is very influential on the achievement of academic achievement through the rejection of the delay and is a self-control that forms the spiritual, emotional, and outward discipline (Duckwonth & Seligman, 2005; Sasson, 2003; Knapczyk, 2004). Self-discipline is created by acknowledgment, willpower, hard work, perseverance, and tenacity and possesses realistic traits, can design goals and be motivated and have more detailed goals (Pavlina, 2006; Folkman, 2009; Gong et.al, 2009). So that self-discipline can be measured through the dimensions of self-ability in delaying satisfaction, self-control, and self-regulating ability. The dimension of self-discipline through the ability to delay gratification, self-control and self-regulation suggests a part that can be used to measure self-discipline. Delaying satisfaction is one's ability to delay temporary satisfaction that leads to goal attainment and abstinence shown to predict desired outcomes in the future through self-control and self-regulation processes (Mitchel et al., 1989; Metcalfe and Mitchel, 1999; Cuskelly et al., 2001). In order to function effectively, the individual must voluntarily postpone temporary satisfaction and keep in the direction of goal behavior for later results (Mitchel et al., 1989).

The ability to have self-control in the discipline shows regularity in internal compliance with an inward impulse (Durkheim, 1990; Beiley, 2004). Self-restraint to resist impulses from within is a momentary stimulus and contradictory to social norms, controlling harmful and emotional actions, and decision-making through behavioral, cognitive and judicial control (Clark, 1990; Berk, 1993; Gilliom, 2002). Self-regulating ability is needed in improving self-discipline (Duckworth et al., 2011). Self-organizing ability is shown in the process of generating thought and active involvement in goal setting, self-monitoring, self-governance and self-oriented self-assessment or positive motivation and self-consistency through dynamic interaction. (Schunk & Zimmerman, 1997; Zimmerman, 2000; Senko & Harackiewicz, 2005; Woolfolk, 2010).The development of self-discipline instrument is tested for reliability and validity to produce valid, practical, and effective self-discipline measurement scales. Testing the validity is done through: (1) content validity; (2) predictive validity; (3) construct validity. Construct validity includes the basic question of whether the resulting score has a useful purpose and positive impact when practiced in real life (Creswell, 2009). The construct validity test is also a test of the validity of the theory that determines the alleged meaning of an action for and measures validation and anticipates the homogeneity of unidimensional and unidimensional traits as objects of theoretical studies

(Edwards 2001; McGrath 2005; Smith et al., 2003; Smith & Combs , 2008). The construct validity test describes the methods and rules of conclusions in which a person develops evidence of validity measurement such as hypothetical construction (Cronbach & Meehl, 1955).

The development of self-discipline must be the responsibility of educators, especially in schools needs to use a touching approach to developing self-discipline of learners, correcting behavioral problems, preventing behavioral problems, and handling learners with behavioral problems seriously. So the self-discipline scale instrument needs to be developed to measure the level of discipline that comes from within the learner.

II. RESEARCH METHODS AND DEVELOPMENT INSTRUMENTS

This research is a developmental research which develops an instrument to measure self-discipline called Self-Discipline Scale. The main purpose of this study is to produce a valid, practical, and effective self-discipline measurement scale. The population in this research is 286 students of eight graders at State Junior High School in Ploso and Plandaan sub-district of Jombang Regency which at this stage there is still one year to develop self potential with a change in self-discipline.

Researchers refer to the theory of self-discipline dimensions expressed by Zimmerman and Schunk (2001), Gilliom et al. (2002), Mitchel et al. (1989). The dimensions of self-discipline cover the following points: (1) self-regulating ability; (2) the ability to control oneself; (3) ability to delay satisfaction. Table 1 shows the dimensions and indicators of self-discipline in instrument development.

Table. 1
Dimension and Indicator of Self Discipline

Variable	Dimension	Indicator	Problem Number
Self-discipline	The ability of self regulation	Able to determine his/her own goal	1, 2, 3, 4
		Able to control his/herself	5, 6, 7
	(Zimmerman and Schunk, 2001)	Able to instruct his/herself	8, 9, 10, 11
		Able to evaluate his his/herself	12, 13, 14, 15
		Able to force his/herself	16, 17, 18,19
		Able to strengthen his/herself (positive)	20, 21, 22, 23
		Able to fulfill his/her own promise	24, 25, 26, 27
	The ability of self control	Able to control emotion	28, 29, 30, 31
		Able to control enforcement	32, 33, 34, 35
	(Gilliom, MS et al,2002)	Able to make decision	36, 37, 38, 39
		Able to taking action	40, 41, 42, 43
		Able to control toward stimulation	44, 45, 46, 47
	The ability to *delay of gratification*	Be bold to quit temporary enjoyment and satisfaction	48, 49, 50, 51
	(Mitchel W. et al, 1989)	Be bold to say no toward instant achievement	52, 53
		Learning in gaining something through process	54, 55, 56, 57
		Not delaying work	58, 59, 60, 61

The development of self-discipline instrument is the main activity in this research. The development of this self-discipline instrument is carried out in two phases: (a) prototyping (prototyping phase), and (b) assessment (phase assessment). The following are consecutive activities described at each stage of development.

2.1 Prototyping Phase
The instrument of Self Discipline as an instrument to measure the discipline of learners. The instrument of self-discipline is designed in the form of statements. The statements are based on indicators of self-discipline. While self-discipline indicators developed based on the dimensions of self-discipline.

2.2 Assessment Phase
Activities undertaken at this stage are field trial activities aimed at finding out whether the self-developed self-discipline instrument (prototype 1) meets the criteria of honesty of respondents in answering, reliably and constructively validity through exploratory factor analysis. The flow of self-discipline instrument development activity is shown in Figure 1.
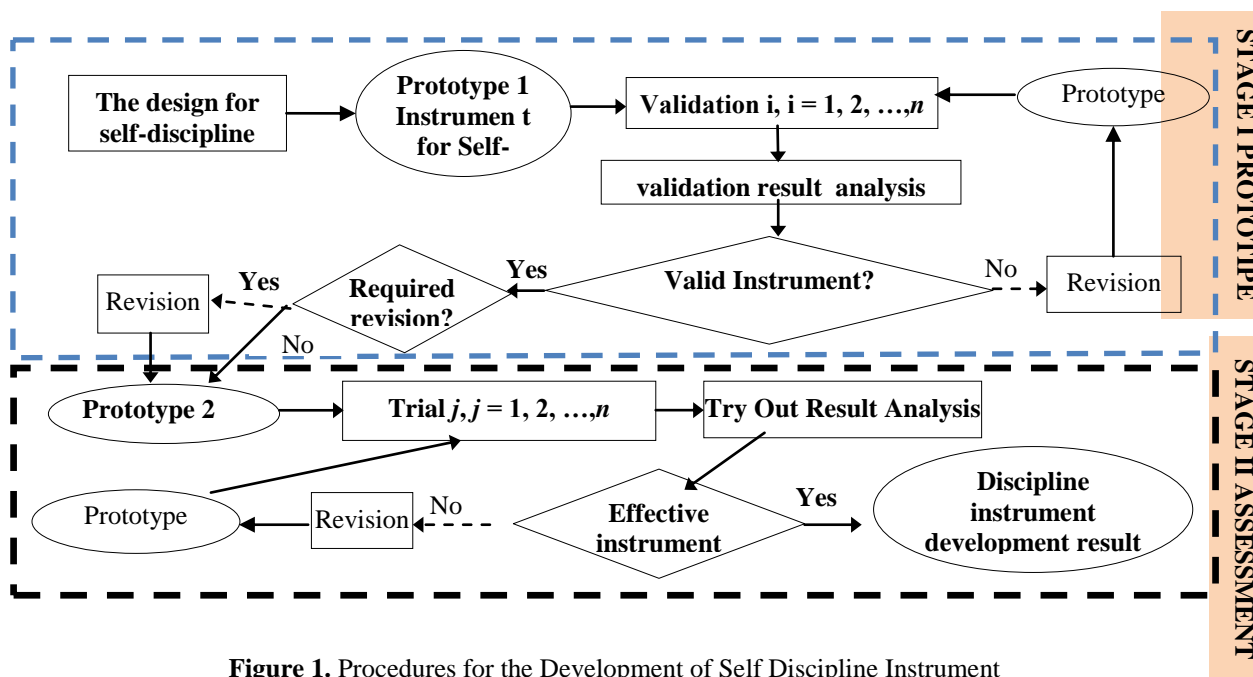
Figure 1. Procedures for the Development of Self Discipline Instrument

Instrument of self-discipline is in the form of questionnaires. This questionnaire uses statements to be answered by respondents by choosing an alternative answer provided. The measurement scale of the questionnaire uses a measurement method developed by Likert (Likert Scale). The Likert Scale used is disagree, quite disagree, hesitating, agree, strongly agree, then being rated 1, 2, 3, 4, 5 for each answer in sequence. Researchers develop the statements that are in the questionnaire based on Dimensions and self-discipline indicators.

2.3   Data Analysis Technique
2.3.1   Outlier Test
Researchers have no way of ensuring that respondents do not lie or answer carelessly. Therefore, the researcher conducts an outlier test to eliminate abnormal data that has a standard deviation value of less than or more than 2.50.
2.3.2   Cronbach's alpha Reliability Test
Cronbach's alpha reliability test was used to measure the reliability of the indicators used in the research questionnaire. So that researchers will get indicators and statements that can measure self-discipline. The researcher assigned the Corrected Item-Total Correlation value of 0.350 as the escaped value to obtain a more accurate test value.

2.4 Exploratory Factor Analysis
Exploratory factor analysis is an analytical technique of several factors that will be formed in the form of latent variables that cannot be determined before the analysis is done. In principle, exploratory factor analysis prior to the formation of factors is random which can then be interpreted in accordance with the factors or components or constructs that are formed, thus the exploratory factor analysis is a technique to help build a new definition that can be used to explain a large number of variables interconnected.

Santoso (2015) stated that this test is done by Barlett test of sphericity and measurement of MSA (Measure of sampling Adequacy) which in the early stages of this analysis is filtered to a number of variables to obtain variable variables that are eligible for further analysis which then through the process Factoring. The variables that have passed and then grouped in one factor has a high correlation, while the correlation with the variables on other factors is relatively low.

Each group of variables represents a basic construct called a factor. To improve factor interpretation power, transformation must be performed on the loading matrix. Transformation is done by rotating the matrix with varimax method. Testing factor analysis is done through several stages that aim to identify a number of factors that can be used to explain a large number of interrelated variables. The study specifies if a statement that has a value <0.500, then the item statement is annulled.

III.   RESULT AND DISCUSSION

The researchers gave a self-assessment instrument portfolio to 286 of eight grade students of Junior High School in Ploso sub-district and Plandaan sub-district of Jombang district in February 2017. The results of the students' answers were analyzed by outlier test, Cronbach's alpha reliability and factor analysis. Here is the discussion of the results of each test.

3.1   Outlier Test

Researchers have no way of ensuring that respondents do not lie or answer carelessly. Therefore, the researchers tested outliers to eliminate abnormal data. So from 286 people there are 36 pieces of data from the respondents who did not pass the next analysis. Indicator statements formulated by the researchers are a number of 16 indicators interpreted in the 61 items of the questionnaire statement.

3.2   Cronbach's Alpha Reliability Test

Researchers tested the reliability of Cronbach's alpha to measure the reliability of the indicators used. The result of Cronbach's alpha reliability test is presented in Table 2 by Item-Total Statistic Result that 13 items of declaration are declared because it has Corrected Item-Total Correlation value <0.350 which is statement item number 1, 2, 3, 14, 16, 24, 29, 30, 34, 40, 45, and 47 as in Table 2. So the researchers obtained 48 statement items that can be further analyzed.

Table. 2
Item-Total Statistics

	Indale Mean if Item Deleted	Indale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IND_1_01	237,5920	483,303	,316		,928
IND_1_02	238,5840	484,164	,266		,929
IND_1_03	238,2840	481,240	,347		,928
IND_4_14	237,7640	485,330	,243		,929
IND_5_16	238,1120	480,694	,261		,929
IND_7_24	238,4480	480,401	,302		,929
IND_8_29	237,7400	485,470	,205		,929
IND_8_30	237,8440	478,325	,275		,929
IND_9_34	237,7720	477,823	,292		,929
IND_11_40	238,6480	481,257	,294		,929
IND_12_45	237,8360	476,250	,344		,928
IND_12_47	238,6720	481,418	,280		,929

3.3   Factor Analysis Testing

Testing factor analysis is done through several stages that aim to identify a number of factors that can be used to explain a large number of interrelated variables. In this research, some items of questionnaire statement which do not fulfill the criteria that have value <0,500.

Table. 3
Failed Indicator in Factor Analysis

Pengujian 1		Pengujian 2		Pengujian 3	
IND_16_61	.456	IND_7_26	.477	IND_4_13	.367
IND_13_49	.447	IND_13_51	.443		
IND_5_19	.407	IND_8_28	.424		
IND_15_54	.363	IND_5_18	.365		
IND_15_55	.477	IND_6_23	.370		
IND_7_25	.402	IND_7_27	.492		
IND_11_43	.394				

IND_10_37	.466
IND_13_50	.477
IND_14_53	.442
IND_10_38	.441
IND_15_57	.483
IND_11_42	.401
IND_15_56	.368
IND_4_12	.323
IND_6_20	.444
IND_3_09	.472

The result of factor analysis test indicates that statement items arranged based on early indicators are randomized. There are 17 items of declaration that fall in Table 3 because it has value <0,500. The second factor analysis test contained 6 items of declared statements and there was only 1 statement item that fell in the third test. In addition, components that meet the criteria of value have been collected into 8 components. So the remaining 24 items of statements are then performed back factor analysis as well as re-grouping statement items into new indicators formed in accordance with the component.

Table. 4
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,830
Bartlett's Test of Sphericity	Approx. Chi-Square	1384,586
	df	276
	Sig.	,000

Results of KMO and Bartlett's test obtained by 0.83 with significance 0.00; The number is already eligible for further analysis because the number has exceeded 0.5 and the significance value is far below 0.05; So the model used can be analyzed using factor analysis.

Table. 5
Rotated Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
IND_16_58	,687	,158	,125	,161	-,036	,087	,190	-,118
IND_16_60	,653	,109	-,067	,177	,166	-,118	,222	,119
IND_13_48	,650	,075	,050	,097	,180	,057	-,110	,088
IND_16_59	,639	,039	,194	,019	,034	,064	-,021	,369
IND_11_41	,616	,134	,067	,004	-,010	,126	,005	-,026
IND_3_11	,222	,729	,004	-,050	,095	,192	,037	,080
IND_2_07	,047	,635	,030	,292	,042	,053	,119	,126
IND_3_10	,290	,628	,128	-,085	,178	,315	-,096	,054
IND_9_35	,234	-,052	,819	,037	,130	,010	,063	,014
IND_8_31	,029	,124	,681	,002	,128	,319	,326	-,040
IND_9_32	-,005	,210	,564	,327	,141	,185	-,097	,118
IND_9_33	,180	-,072	,218	,771	,133	,103	-,095	,050
IND_6_21	,102	,141	-,019	,643	,089	,164	,174	,082
IND_3_08	,114	,469	,040	,508	-,044	-,026	,240	-,062
IND_10_36	-,039	,300	,095	,056	,782	,001	,034	-,029

IND_14_52	,201	-,073	,047	,155	,745	,159	,156	-,040
IND_12_46	,155	,037	,286	,024	,587	-,051	-,016	,277
IND_5_17	,097	,109	,210	,186	,041	,694	,017	-,045
IND_6_22	,072	,151	,084	,055	,017	,660	,162	,176
IND_2_05	,030	,138	,157	,112	,076	,192	,717	,150
IND_10_39	,411	-,146	-,103	-,012	,131	,313	,513	-,061
IND_2_06	,014	,479	,200	,163	,055	-,227	,506	,159
IND_1_04	,089	,126	,019	,025	,038	,053	,090	,857
IND_4_15	,114	,159	,009	,317	,104	,458	,187	,531

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 9 iterations.

Factor analysis that has been presented in Table 5 shows that the grouping of factors formed is composed of the equation or homogeneity of the content. Component 1 correlates with IND_16_58, IND_16_60, IND_13_48, IND_16_59 and IND_11_41 with values of each indicator> 0.60, whereas component 2 correlates with values> 0.60 to 0.729 with IND_3_11, IND_2_07 and IND_3_10. Component 3 correlates with IND_9_35, IND_8_31 and IND_9_32 with values> 0.56 to 0.819. Component 4 correlates with IND_9_33, IND_6_21 and IND_3_08 with values> 0.508 to 0.771. Component5 correlated with IND_10_36, IND_14_52 and IND_12_46> 0,580 with values> 0.587 to 0.782, whereas component 2 correlated with the value of each indicator> 0.60 with IND_3_11, IND_2_07 and IND_3_10. IND_2_05: 0,717; IND_10_39: 0,513; IND_2_06: 0,506 is most correlated with component 7. While IND_1_04 of 0.857 is more correlated with component 8, so also IND_4_15: 0.531 goes into component 8. Being aware of factor analysis, item items are able to describe the indicators of the self-discipline dimension. So the results are then reformulated by adjusting the sequence number and self-discipline dimension indicator shown in Table 6 through Self-discipline scale instrument.

Table. 6
Indicator on Self Discipline Dimension

Variable	Dimension	Indicator	No. Item		Total Item
			Try Out	**After Try Out**	
Self Discipline	Able to *delay of gratification* Mitchel W. et al (1989)	Do not delay school assignment	58, 60, 48, 59, 41	1, 2, 3, 4, 5	5
	Able to have self-control Gilliom, MS et al. (2002)	Able to force his/her own goal (positive)	11, 7, 10	6, 7, 8	3
		Able to control temptation	35, 31, 32	9. 10. 11	3
		Able to strengten her/himself (positive)	33, 21, 8	12. 13.14	3
	Able to organize *self regulation* Zimmerman and Schunk (2001)	Able to make decision	36, 52, 46	15, 16, 17	3
		Able to fulfill his/her own promise	17, 22	18, 19	2
		Able to supervise his/herself	5, 39, 6	20, 21, 22	3
		Able to determine his/her own goal	4, 15	23, 24	2

IV.   CONCLUSION

The dimensions of self-discipline in this research cover: (1) the ability to delay satisfaction; (2) the ability to control oneself; (3) the ability to organize themselves. The results of this study show indicators and statements that correspond to the dimensions of self-discipline. These statements are used to measure the self-discipline of learners. Based on outlier test results, Cronbach's alpha reliability test and exploratory factor analysis indicate that the indicator representing dimension: (1) ability in delaying satisfaction is not delaying the task of school. Indicators that represent dimensions (2) the ability to control themselves are able to impose themselves (positive things), able to control the impulse, and able to strengthen themselves (positive). While the indicators that represent dimensions (3) the ability to self-manage is capable of making decisions, able to keep promises themselves, able to monitor themselves, and able to determine his/her own goals.

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