International Journal of Instruction
e-ISSN: 1308-1470 ● www.e-iji.net

April 2022 ● Vol.15, No.2
p-ISSN: 1694-609X
pp. 207-222

Article submission code: 20210318103951
Received: 18/03/2021
Revision: 28/09/2021
Accepted: 21/10/2021
OnlineFirst: 23/01/2022

Analysis of the Reliability and Validity of the Self-Determination Questionnaire Using Rasch Model

Heri Yusuf Muslihin
Universitas Pendidikan Indonesia, Indonesia, *heriyusuf@upi.edu*

Dodi Suryana
Universitas Pendidikan Indonesia, Indonesia, *dodisuryana@upi.edu*

Ahman
Universitas Pendidikan Indonesia, Indonesia, *ahman@upi.edu*

Uman Suherman
Universitas Pendidikan Indonesia, Indonesia, *umans@upi.edu*

Tina Hayati Dahlan
Universitas Pendidikan Indonesia, Indonesia, *tinadahlan_psi@upi.edu*

Self-determination can affect students to have a positive way of thinking and acting, also to make realistic choices so they can make a decision responsibly. This study aimed to develop a questionnaire to measure student self-determination and validate it. This study was conducted in 2019, involved 406 university students as participants consisting of 78 males and 328 females, aged 20-24 years in Universitas Pendidikan Indonesia. This study utilized the quantitative approach as its method and there are 18 questionnaires with a 7-point Likert scale as an answer choice. The data analysis used the Rasch model, "i.e." Winsteps software. Study results show that the Cronbach Alpha value, which measures the interaction between the person and items, is 0.96, which falls into the excellent category of performance. In addition, the Person Reliability of 0.94 demonstrates that the respondents have consistently correctly answered questions, even in the outstanding category. The items in the self-determination questionnaire have high reliability so that they can be used to measure the self-determination of university students.

Keywords: reliability, validity, university student, self-determination, rasch models

INTRODUCTION

The success in achieving self-determination in students is one of the fundamental and essential aspects of self-regulation. Self-determination will help students to have a positive way of thinking and acting and to make realistic choices; self-determination means a process of having a constructive behavioral direction that lasts a lifetime (Ryan et al., 2019; Ryan & Deci, 2006, 2017). Holistic self-determination encourages students

Citation: Muslihin, H. Y., Suryana, D., Ahman., Suherman, U., & Dahlan, T. H. (2022). Analysis of the reliability and validity of the self-determination questionnaire using rasch model. *International Journal of Instruction*, *15*(2), 207-222. https://doi.org/10.29333/iji.2022.15212a

to have the ability, opportunity to communicate and collaborate flexibly, to present options from the results of thinking that are skeptical, critical, and creative, and exercise control and take personal decisions according to their conscience (Deci & Ryan, 2000). Students who achieve self-determination must be sure, happy, optimistic, determined, and strong spirit (Chettiar & Raj, 2012; Hau et al., 2013; Silva et al., 2014).

Self-determination development is intended so that students have health, happiness, the internal focus of control, interest, integrativeness, and development of implicit intelligence (Carter, 2011; Martela & Ryan, 2016; Renaud-Dubé et al., 2015). To support it, the minister invites universities, especially lecturers who are frontline figures to produce quality student graduates by carrying out the 4 C's, namely critical thinking, creativity, communication, and collaboration.

Based on developmental psychology, students should achieve developmental tasks that emphasize behavioral tendencies to form self-determination so that they can follow the rules, engage in interesting activities that create fun, satisfaction, and independence inherent in students (Bartholomew et al., 2011; Garrin, 2014). If the student can fulfill the task, then he has high self-determination. It's different if he fails, then he will be in a self-determination crisis that has weak self-motivation.

From 2015 to 2017, some students at Universitas Pendidikan Indonesia showed that self-determination was mostly in external regulation category. From the results, the proportion of student self-determination achievement spreads to six levels, with a sequence of external regulation, integrated regulation, intrinsic regulation, and introjected regulation, identified regulation, and amotivation (Ryan & Deci, 2000b).

Based on the results of non-formal observations, the attendance data from 197 or 60% of students are late entering class, experiencing boredom attending lectures, a tendency not to attend lectures or skipping classes, and final year students have a difficult tendency to interact or consult with lecturers and students are difficult to make a final project / scientific paper. As many as 123 final year students cited the existing thesis materials directly. Weak self-determination data appeared in the counseling process with 4 students, the finding was that students had no intention of going to college, even doing assignments given by the lecturer. Based on Deci and Ryan's theory, these students are categorized into the amotivation level.

From this study, students tend to work on assignments in a hurry just to fulfill obligations and be respected by others. In addition, students also tend to do something only because of personal interest, and feel pressure or controlled to do something (Deci et al., 1991; Di Domenico & Ryan, 2017; Nota et al., 2014).

The research result of American College Health Associations states that out of 97,357 students, 32% of them have low self-determination, which is indicated by the students being unable or unsuccessful to complete academic activities (Cui et al., 2019; Leow et al., 2016; Trenshaw et al., 2016). Weak self-determination if students are allowed to experience or are threatened with dropout, anger, bullying, frustration, anxiety, and depression as well as suicide (Litalien et al., 2017; Nishimura & Suzuki, 2016). In making a further follow-up, self-determination identification is needed. Identifying self-determination requires caution and accuracy, which means that self-determination

identification must use valid instruments and can describe self-determination properly according to individual conditions.

A self-determination instrument that has been analyzed and declared valid is an instrument capable of describing self-determination (Planinic et al., 2019; Stout et al., 2012). Rasch Model analysis was used to investigate the instrument validity. In the model, unidimensionality, wright maps, item analyses, participant ability analyses, and instrument analyses are considered as measures of instrument quality. (Fisher, 2007; Planinic et al., 2019; Sumintono, 2018). Therefore, this research examined a self-determination assessment instrument for students. Self-determination disclosure is the instrument being analyzed. Rasch Models provide information on the scale structure of an instrument, so that the disclosing instrument of self-determination is valid or invalid.

METHOD

Participants

The research uses the quantitative method and 18 questionnaires each containing a choice of seven points on a Likert scale. This study used a purposive sampling whereby a total of 406 university students as participants consisting of 78 males and 328 females, aged 20-24 years from six faculties in Universitas Pendidikan Indonesia. Below are the research participant's data.

Table 1
Participants

Faculty	Male	Female	Total
Faculty of Technology and Vocational Education (FTVE)	10	66	76
Faculty of Educational Science (FES)	7	78	85
Faculty of Social Science Education (FSSE)	23	63	86
Faculty of Sport and Health Education (FSHE)	16	46	62
Faculty of Mathematics and Science Education (FMSE)	5	35	40
Faculty of Languange and Literature Education (FLLE)	17	40	57
Total	78	328	406

Data collection is done by distributing questionnaires directly to participants in 2019. The students are informed about the general purpose of the study, and they are confident that their data is handled to protect their privacy. In this study, all participants are recruited voluntarily without being compensated or offered incentives by the researcher.

Indonesian Version of Self Determination Questionnaire

This study used an ordinal scale instrument based on independent research data, not normally distributed, and the variables were continuous (Cresswell & Clark, 2011; Creswell, 2009). The instrument's concept will collect data on aspects and levels of intrinsic motivation based on self-determination theory. The questions of intrinsic motivation are derived from the attributes of competency, connectedness, and independence aspects as basic needs that develop intrinsic motivation based on self-determination theory, which refers to the Self Determination theoretical concepts (Deci & Ryan, 1985; Nguyen & Deci, 2016). Meanwhile, to determine the level of intrinsic motivation based on theory, self-determination is pursued where playing style attributes

regulation of the achievement of self-determination that is amotivation, external regulation, identified regulation, introjected regulation, and intrinsic motivation.

Each item of the statement is presented in a favorable and unfavorable item. The data collection instrument grid that was created combines two research instruments proposed by Kanat-Maymon & Reizer, (2017), Korthagen & Evelein, (2016), and Vansteenkiste & Sheldon, (2006). The Rasch Model is used to evaluate instruments research quality which has the trait latency characteristic of representing the main idea of item response theory (IRT). Though these traits can't be empirically measured or observed, they can be observed and measured by manifestations, characteristics, and interactions with the surrounding environment (Fisher, 2007; Taufik et al., 2019).

Data Analysis Procedure

The analysis procedure uses the Rasch model application with Winstep. First, the development of a self-determination instrument, where this stage includes verifying the assumptions of unidimensionality and independence of measurement, testing the accuracy of the items (INFIT-OUTFIT), and measuring items and item fit orders. Second, Both detection bias measurement of thing is done to determine grain items that have the characteristics of differential item functioning (DIF), which has a p-value (PROB) in under 0,05. Third, detection bias of individuals who can be known through the data person: DPF, between/within, things have occurred if the individual does not consistently fill grain items that responsibility, The bias detection technique knows the answers that arise from cheating. Fourth, the identification of the dimensionality of the measurement regard is to show how the variance. Fifth, testing of a scale of ratings (rating scale) procedure of analysis to verify that are used can be understood or confuse the respondent, the result of which is shown is the average observation and Andrich threshold.

FINDINGS

Unidimensionality

An instrument's unidimensionality is defined by its ability to measure a wide variety of attributes. This analysis uses Output Table 2. with due regard, the data analysis results showed that Raw variance explained by measures of 42.68% was in a suitable category. Meanwhile, the unexplained variance in the contrast of residuals from the 1st to the 5th is 7.4%. 6.6%, 6.1%, 5.5%, and 5.2%, respectively. An argument for unidimensional measurement can be made if the raw variance can be explained by the measures ≥ 20% (Ramdani et al., 2020), (Interpretation criteria are as follows: sufficient if between 20% and 40%, good if between 40% and 60%, and very good if above 60%) and v variation of 15% between the 1st and 5th contrast of residuals is unexplained (Karlimah et al., 2020; Nur et al., 2020; Rusmana et al., 2020). Therefore, the instrument is built to measure a single variable, namely the student's Self Determination as a whole.

Wright Map Analysis (Person-Item Map)

According to Output and Variable Map, students at Universitas Pendidikan Indonesia have self-determination management ranging from -1 to 4 logits. Their Self-

Determination management position is mostly between -2SD and + 2SD. However, some of them have outliers' abilities, namely extreme high and extreme low. For students at Universitas Pendidikan Indonesia, the average logit for self-determination management is 1.77, which is above the item standard logit of 0.00. This indicates that the average logit of self-determination for students at Universitas Pendidikan Indonesia is above the average difficulty level of the item.

The item difficulty map ranges between -1 and 1 logit. While 18 of the items have difficulty levels between -2SD and +2SD, 15 and 9 have difficulty levels above +2SD. Thus, items 15 and 9 have a difficulty level for items, including outliers. Standards items are generally below the self-determination level of the students. Thus the items of self-determination instrument are easily approved by the students of Universitas Pendidikan Indonesia.

Item Analysis

Items are analyzed for level of difficulty (item measure), item fit, and bias.

Item level of difficulty

The study results shows that the SD value is 0.41. The item difficulty level can be categorized into four groups based on this SD value and logit average: very difficult categories (greater than +1 SD), difficult (0.0 logit + 1 SD), easy (0.0 logit - 1 SD), and very easy (less than -1 SD). Thus, the value limit for the very difficult category was more than 0.41, the difficult category was 0.00 to 0.41, the easy category was -0.41 to less than 0.00, and the very easy category was less than -0, 41, in detail difficulty table 2.

Tabel 2
Difficulty category

Entry Number	Total Score	Measure	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	Ptmeasure-Al Corr.	Exp.	Exact Obs%	Match Exp%	Item
15	1215	0.78	1.67	8.83	1.69	9.1	0.06	0.28	28.1	36	15
9	1270	0.67	1.18	2.66	1.18	2.7	0.37	0.28	41.6	35.8	9
8	1360	0.48	0.46	-9.9	0.47	-9.9	0.24	0.28	58.6	35.3	8
10	1424	0.35	0.76	-4	0.76	-4	0.45	0.28	40.4	34.9	10
6	1493	0.2	1.16	2.3	1.16	2.38	0.17	0.27	22.4	34.8	6
1	1526	0.13	0.59	-7.2	0.59	-7.29	0.28	0.27	55.2	34.9	1
5	1532	0.11	0.63	-6.45	0.62	-6.6	0.24	0.27	54.2	34.9	5
16	1566	0.04	0.55	-8.1	0.54	-8.44	0.32	0.27	69.5	35	16
2	1574	0.02	1.03	0.44	1.04	0.55	0.33	0.27	19.7	35.1	2
14	1582	0	0.59	-7.22	0.59	-7.23	0.27	0.27	45.6	35.1	14
13	1592	-0.02	1.22	3.06	1.2	2.84	0.39	0.27	8.9	35.1	13
3	1618	-0.08	1.16	2.32	1.14	2.07	0.32	0.27	43.3	35.2	3
7	1667	-0.19	0.64	-6.15	0.63	-6.31	0.26	0.26	58.4	35.2	7
18	1673	-0.21	1.29	4	1.26	3.65	0.28	0.26	32.5	35.2	18
11	1741	-0.37	1.09	1.25	1.05	0.73	0.31	0.26	37.9	35.6	11
12	1792	-0.5	1.71	8.65	1.7	8.53	0.19	0.25	25.9	37.3	12
4	1813	-0.56	1.46	5.96	1.43	5.59	0.26	0.25	28.8	38.1	4
17	1922	-0.86	0.89	-1.57	0.86	-2.06	0.2	0.24	56.7	42.9	17
Mean	1575.6	0	1	-0.6	1	-0.8			40.4	35.9	
P.SD	178.7	0.41	0.38	5.7	0.38	5.7			15.8	1.9	

According to the logit values for each item in the suitability level of the items, from the most difficult to the easiest item, there are three items that are very difficult. They are 15,

9, and 8. There are seven categories of difficult items including numbers 10, 6, 1, 5, 16, 2, and 14. In easy categories there are 5 items, including 13, 3, 7, 18, and 11. While, the category for very easy items consists of three items, namely 12, 4, and 17.

Item conformity level

According to Item Fit Order (Table 10 in Winstep), namely the OUTFIT mean square (MNSQ) column, the OUTFIT Z-standard (ZSTD), and the point measure correlation (PT MEASURE CORR), the level of fit (item fit) can be evaluated so that both students and teachers can avoid misconceptions about the items. Boone et al. (2014) suggests following criteria to check whether an item is fit (item fit) or not fit (outlier or misfit). These criteria are (1) the MNSQ OUTFIT value is greater than 0.5 and less than 1.5, the closer to 1, and (2) the ZSTD OUTFIT value is greater than -2.0 and smaller than +2.0, the closer to 0, and (3) the value of PT MEASURE CORR is greater than 0.4 and less than 0.85. Table 3 lists the three criteria that must be met by the item to be considered fit.

Table 3
The level of suitability items

No	Score	Measure	MNSQ	ZSTD	MNSQ	ZSTD	Corr.	Exp.	Obs%	Exp%	Item
12	1792	-0.5	1.71	8.65	1.7	8.53	.19	0.25	25.9	37.3	12
15	1215	0.78	1.67	8.83	1.69	9.1	.06	0.28	28.1	36	15
4	1813	-0.6	1.46	5.96	1.43	5.59	.26	0.25	28.8	38.1	4
18	1673	-0.2	1.29	4	1.26	3.65	.28	0.26	32.5	35.2	18
13	1592	-0	1.22	3.06	1.2	2.84	.39	0.27	8.9	35.1	13
9	1270	0.67	1.18	2.66	1.18	2.7	.37	0.28	41.6	35.8	9
3	1618	-0.1	1.16	2.32	1.14	2.07	.32	0.27	43.3	35.2	3
6	1493	0.2	1.16	2.3	1.16	2.38	.17	0.27	22.4	34.8	6
11	1741	-0.4	1.09	1.25	1.05	0.73	.31	0.26	37.9	35.6	11
2	1574	0.02	1.03	0.44	1.04	0.55	.33	0.27	19.7	35.1	2
17	1922	-0.9	0.89	-1.6	0.86	-2.1	.20	0.24	56.7	42.9	17
10	1424	0.35	0.76	-4	0.76	-4	.45	0.28	40.4	34.9	10
7	1667	-0.2	0.64	-6.2	0.63	-6.3	.26	0.26	58.4	35.2	7
5	1532	0.11	0.63	-6.5	0.62	-6.6	.24	0.27	54.2	34.9	5
1	1526	0.13	0.59	-7.2	0.59	-7.3	.28	0.27	55.2	34.9	1
14	1582	0	0.59	-7.2	0.59	-7.2	.27	0.27	45.6	35.1	14
16	1566	0.04	0.55	-8.1	0.54	-8.4	.32	0.27	69.5	35	16
8	1360	0.48	0.46	-9.9	0.47	-9.9	.24	0.28	58.6	35.3	8
Mean	1576	0	1	-0.6	1	-0.8			40.4	35.9	
P.Sd	179	0.41	0.38	5.7	0.38	5.7			15.8	1.9	

The first criterion is known that 2 items are misfit, namely numbers 12 and 15., each of which has MNSQ OUTFIT values of 1.71 and 1.67. There are 12 items that don't fit the second standard, namely the numbers 12, 15, 4, 18, 13, 9, 17, 10, 7, 5, 14, and 8. Moreover, 18 items were found to have an PT MEASURE CORR with more than 0.4 but a value of less than 0.85, according to the third criterion.

Rating Scale Diagnostic

Participants are assessed to find out if they comprehend the difference between the answer choices in the levels of Self Determination 1, 2, 3, 4, 5, and 6. Respondents understand the difference in answers if the observed average and Andrich threshold values increase according to their level, in detail the Andrich threshold values Table 4.

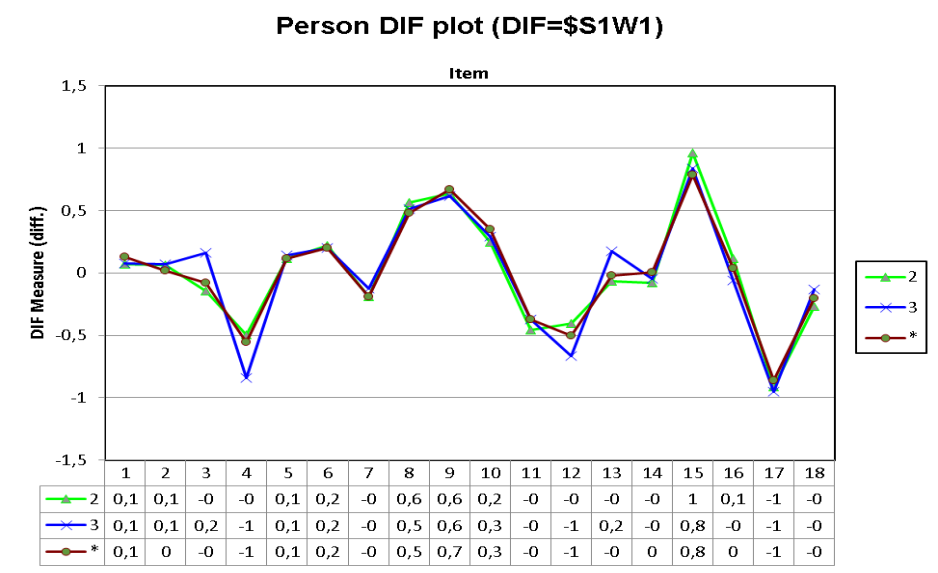
Table 4
Rating scale diagnostic

Category Label	Observed		Observed Sample		INFIT	OUTFIT	Andrich Threshold	Category Measure
	Count	%	Average	Expect	MNSQ	MNSQ		
1	203	3	-0.22	-0.3	1.08	1.11	NONE	(-2.81)
2	623	9	-0.14	-0.11	0.97	0.98	-1.32	-1.45
3	1830	25	0.04	0.08	0.91	0.91	-1.09	-0.53
4	2321	32	0.28	0.27	0.76	0.76	-0.07	0.33
5	1849	25	0.52	0.46	0.87	0.88	0.59	1.44
6	482	7	0.48	* .65	1.28	1.23	1.9	-3.17

This table shows suitability and is equally increasing at alternative levels 1, 2, 3, 4, 5, and 6. The analysis results show that the level of the Self Determination instrument is following the real conditions of student behavior.

Item Bias Detection

Validity can also be measured by the fact that the instruments and items used are unbiased since they are more helpful to people with specific characteristics compared to those with others. Biased statement items have probability values below 0.05 as shown in Output Figure 1. In the context of this research, bias is only seen from gender. In the gender bias analysis, only one item was found to be biased, item number 6 (p = 0.022). Figure 1 shows the logit position based on gender for each item.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
2	0,1	0,1	-0	-0	0,1	0,2	-0	0,6	0,6	0,2	-0	-0	-0	-0	1	0,1	-1	-0
3	0,1	0,1	0,2	-1	0,1	0,2	-0	0,5	0,6	0,3	-0	-1	0,2	-0	0,8	-0	-1	-0
*	0,1	0	-0	-1	0,1	0,2	-0	0,5	0,7	0,3	-0	-1	-0	0	0,8	0	-1	-0

Figure 1
Item logit position based on gender

According to the figure, item number 6 is easier for male students to do and, therefore, has a more positive effect on male students than female students.

Instrument Analysis

Analyzing instruments is also performed through statistical summary tables. Table 5 illustrates the instrument's analysis.

Table 5
Instrument analysis

Summary Person

	Total Score	Count	Measure	Model S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD
Mean	69.9	18	0.24	0.23	0.99	-0.17	1	-0.15
Sem	0.3	0	0.01	0	0.02	0.08	0.03	0.08
P.Sd	5.2	0	0.27	0.01	0.5	4.54	0.51	4.54
S.Sd	5.2	0	0.27	0.01	0.5	4.54	0.51	4.54
Max.	83	18	0.98	0.25	2.93	6.36	3.04	4.53
Min.	53	18	-0.58	0.22	0.18	-8	0.18	-8.01
Real RMSE	0.25	True SD	0.34	S	3.4	PR		0.94
Model RMSE	0.23	True SD	0.34	S	7.61	PR		0.97
S.E. Of Person Mean = .07								

Summary items

	Total Score	Count	Measure	Model S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD
Mean	1575.6	406	0	0.05	1	-0.62	1	-0.76
Sem	43.3	0	0.1	0	0.09	1.39	0.09	1.39
P.Sd	178.7	0	0.41	0	0.38	5.73	0.38	5.75
S.Sd	183.9	0	0.42	0	0.39	5.9	0.39	5.91
Max.	1922	406	0.78	0.05	1.71	8.83	1.7	9.1
Min.	1215	406	-0.86	0.05	0.46	-9.9	0.47	-9.9
Real RMSE	0.5	True SD	0.41	S	7.79	IR		0.98
Model RMSE	0.5	True SD	0.41	S	8.43	IR		0.99
S.E. Of Person Mean = .10								

Note: S: Separation, PR: Person Reliability, IR: Item Reliability

In the student self-determination data disclosure instrument, the person measure shows the average score for all participants. A participant's average score that is greater than the item mean (where the item mean is 0.00 logit) suggests their abilities are generally more significant than the instrument items difficulties.

Cronbach's Alpha, which reflects the interaction between the items and the person, represents this interaction, is 0.96, which is in the excellent category. Furthermore, the Person Reliability value is 0.94 as an indicator of the consistency of the respondents' answers, including in the outstanding category. Meanwhile, Item Reliability is 0.98, which is a measure of the instrument item quality

Data from the Person table and Item table also shows MNSQ INFIT and MNSQ OUTFIT. On the basis of the Person Table, it can be determined that the average MNSQ INFIT and MNSQ OUTFIT values are 0.99 and 1.00, respectively. According to the MNSQ INFIT and MNSQ OUTFIT values, the MNSQ INFIT was 1.00 and the MNSQ OUTFIT was 1.00. Since the ideal value is 1, the closer the value is to number 1, the better. Therefore, a typical person and item are close to the ideal. In addition, the OUTFIT ZSTD and INFIT ZSTD for the person are each -0.17. Additionally, the INFIT ZSTD value for the items was -0.62 and the ZSTD OUTFIT value was -0.76. ZSTD should be valued at 0, the closer to 0 the better. As a result, it is possible to describe the item or person as good.

The last is about the separation or grouping of people and items. Based on individual separation, the student's Self-Determination instrument allows them to see how well they can use a set of items to show their abilities across the range of abilities. As a consequence, the instrument is best arranged when there is a large individual spacing because the items can be reached by individuals of all abilities. Separation of items shows how large a sample is impacted by the spread in measurement along a linear interval scale. The means of the construct being measured can also be defined by this index. When the grain separation is higher, the measurement will be more accurate.

According to Table 5, the separation of persons and items is 3.40, and the separation value for items is 7.79. The higher the separation value, the more quality the individual and their instrument possess. The separation value is determined using a more precise formula: H = [(4 x separation + 1) / 3]. As a result, rounded to 5, the value for separation for persons is 4.87, while for separation for items it is 11. Study participants had a variety of abilities that could be classified into four groups. These groups were divided by item difficulty level into 11 categories, ranging from the easiest to the most difficult.

DISCUSSION

Based on the unidimensionality results, the instrument of self-determination to show the value of unexplained variance in the bottom 15% represents an instrument of self-determination that can measure as a whole. It is impacting self-determination instrument will get a result that is accurate about individual functioning that involves a choice of ways of thinking and acting on purpose that forms self-reliance, including commitment, consistency, pleasure, responsibility, optimism, determination, enthusiasm, and a sense of sincerity. With the study results by (Bartholomew et al., 2011; Haerani et al., 2020; Marsden et al., 2015). The integrity of each aspect of self-determination would be an "essence of belonging." Even the value of natural variance explained by the measure amounted to 42.68%, which has a construct of the instrument really can measure on each aspect of self-determination includes the first aspect of competence feel in the sense of the form needs essential people to feel the impact and mastery of the required and desired more interested, open and learn more well to adapt to the challenges that face, and competence have mastery over skills competence that has control, a sense of want to know, have various ideas epistemic, and demonstrate proficiency in the conduct of all

activities and can improve the quality of performance through a process of learning and experience.

The second aspect of connectivity, which means having a simplification pattern of behavior that indicated others influencing that beneficial in constructive, and how to communicate that is good and true to develop linkages safe and caring towards others. The third aspect of independence, the emergence of a sense of a conversation to choose based on the actions that favored that the process of action discipline, commitment, and consistency, and understand and feel the consequences of the activities are performed. Can emphasize the development of an instrument of self-determination will generate profiles embodiment form of behavior which has selfhood that each individual is different from the others, and the process of formation of self-determination is not apart from knowledge, communication with various parties that have an impact have behavior/objectives are clear.

Item Analysis The first criterion is known that two items are misfits, namely numbers 12 and 15, each of which has MNSQ OUTFIT values of 1.71 and 1.67. According to the second standard there are 12 items that are misfit, namely the numbers 12,15,4,18,13,9,17,10,7,5,14, and 8. The third criterion indicates that at least 18 items had a PT MEASURE CORR value greater than 0.4 and less than 0.85. Regarding to the view of Boone et al., (2014) and Planinic et al. (2019), there are 18 items of student self-determination that have been declared valid in terms of normal functioning, understood by students, and measurable in terms of self-determination.

Rating Scale Diagnostic is made to determine the participants understood to be the difference choice answers in self-determination levels 1,2,3,4,5 and 6 are determined by the value of an observed average and Andrich threshold. The self-determination stories start from the group of amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic regulation. Results of rating scale instrument of self-determination indicate the value observed and Andrich threshold (Rasch-Andrich threshold) increased by the systematic case is by the results of the study (Litalien et al., 2017; Nishimura & Suzuki, 2016). Attributed to the theory of self-determination (Ryan & Deci, 2000a) and the results of the opinion (Korthagen & Evelein, 2016), the study's findings suggest that acting and changing deliberate cognition can affect self-determination, which is defined as changes in the way students handle specific tasks.. Internalizing and assimilation of values will lead to a higher level of individual autonomy in behavior (more self-determined).

In developing self-determination in producing specific actions or a level of identified regulation, there is a need for control if control is not accompanied by self-determination. The individual who has control does not guarantee a high level of self-determination like this individual who feels pressure to achieve the result of an action or is forced to exercise his control for something. The individual lacks or does not have self-determination.

Item 6 bias is influenced by several factors education including the capacity of academic. Academic capacity characterized by 1) the individual can gain insight into the

mature, know and understand the strengths and weaknesses, achieve motivation intrinsic or achieve self-determination and has a picture of yourself that is realistic (not distorting), 2) the individual can perform analysis, synthesis even produce a product which involves the integration of skills, knowledge, experience, and understanding, 3) the individual has the ability anticipation of the future to come that involve or utilize the expertise of time past, and 4) the individual has insight that matures able to see life as a whole are integrated and associated, even in the form of a philosophy of life that the life of religion is the core meaning of life (Appleton et al., 2016). Factors Culture Capacity of understanding, which is characterized by 1) individuals who have the insight that mature should show attention and participation of the depth of the diversity of current culture, 2) the individual can learn from the experience of others, 3) an individual can read and learn from the reality of life.

The ability of transcendence of self, which is characterized by 1) the individual can move beyond the concerns individualistic-egocentric to issues of collective and universal about reality, 2) individuals achieve gnosis in the tradition of (Mueller, 2017; Stout et al., 2012) and 3) the individual has a motive altruistic that by the values of universal.

Instruments analysis levels of self-determination proved to be able to know the dynamics of the behavior of individuals, things are by the research (Ryan & Deci, 2005). It describes the tendency of the behavior of people, as many as 85 of the 654 people were at the level of amotivation which marked students are not sure of the competence that it has, the inability yourself, do not exist or lack of interest and does not have the purpose of the study were evident, the level of external regulation, also have a category pretty much as many as 364 people, the condition of this means that students perform actions based on the urge to earn rewards. The position of the last in the interjections has a category of pretty much 205, and this condition means that students act to defend the ego.

The research findings can at least describe several things, namely 1) each individual looks for their unique potential to become capable and autonomous individuals in showing their functioning, emphasizing the importance of choices and other constructs related to oneself, 2) self-determination is owned by individuals who have options. , not the one who does something under pressure, 3) the individual exercises his control over something and is free to determine what kind of result he wants from an action, or when that person chooses to give up that control, that is where self-determination emerges, and 4) the individual who feels controlled or being forced to achieve a specific result from any act, which shows the absence of self-determination, will suffer the same negative impact as a person who has no control at all.

CONCLUSION

The Self Determination disclosure instrument is very useful to reveal the student's self-determination. The number six bias, genders are more favorable to men, does not meet the standard criteria as a measuring tool. Thus, the items that are adequate for use in the Self Determination disclosure instrument are 17 items. The suggested answer scale is 6

levels. Additionally, Cronbach Alpha, which measures how individuals interact with items as a whole, has been classified as excellent. The Person Reliability value is also in the excellent category, which indicates that the respondent's answers are consistent. Meanwhile, item reliability is classified as a special category as an item quality indicator. Items on the professional identity of student-teacher candidates are more likely to produce high information on individuals with moderate to low ability. The average difficulty level of the item standard is below the ability level of students at the University of Pendidikan Indonesia. Thus the items of the Self Determination instrument are easily approved by students in Higher Education.

ACKNOWLEDGEMENTS

Our thanks go to Universitas Pendidikan Indonesia for providing us with a grant to carry out this research. Thank you also to all those people who have contributed to this research.

REFERENCES

Appleton, P. R., Ntoumanis, N., Quested, E., Viladrich, C., & Duda, J. L. (2016). Initial Validation of the Coach-Created Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ-C). *Psychology of Sport and Exercise*, *22*, 53–65. https://doi.org/10.1016/j.psychsport.2015.05.008

Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., Bosch, J. A., & Thøgersen-Ntoumani, C. (2011). Self-determination theory and diminished functioning: The role of interpersonal control and psychological need thwarting. *Personality and Social Psychology Bulletin*, *37*(11), 1459–1473. https://doi.org/10.1177/0146167211413125

Boone, W. J., Yale, M. S., & Staver, J. R. (2014). Rasch analysis in the human sciences. In *Rasch Analysis in the Human Sciences*. https://doi.org/10.1007/978-94-007-6857-4

Carter, J. A. (2011). Changing Light Bulbs: Practice, Motivation, and Autonomy. *The Counseling Psychologist*, *39*(2), 261–266. https://doi.org/10.1177/0011000010391915

Chettiar, C., & Raj, S. J. M. (2012). Self-Determination Theory: How Basic Psychological Needs Affect Well-Being. *Biopsychosocial Issues in Positive Health*, *3*(1), 17–21. https://www.researchgate.net/publication/302300677

Cresswell, J. W., & Clark, V. L. P. (2011). Designing and conducting mixed methods research. 2nd edn Sage Publications Inc. *Thousand Oaks, CA*.

Creswell, W. J. (2009). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. In *Sage* (third). https://doi.org/10.2307/1523157

Cui, M., Allen, J. W., Fincham, F. D., May, R. W., & Love, H. (2019). Helicopter Parenting, Self-regulatory Processes, and Alcohol Use among Female College Students. *Journal of Adult Development*, *26*(2), 97–104. https://doi.org/10.1007/s10804-018-9301-5

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self Determination in Human Behavior*. Plenum Press. https://doi.org/10.1007/978-1-4899-2271-7

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Source: Psychological Inquiry Psychological Inquiry Copyright C)*, *11*(4), 227–268. http://www.jstor.org/stable/1449618%0Ahttp://www.jstor.org/stable/1449618

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and Education: The Self-Determination Perspective. *Educational Psychologist*, *26*(3), 325–346.

Di Domenico, S. I., & Ryan, R. M. (2017). The Emerging Neuroscience of Intrinsic Motivation: A New Frontier in Self-Determination Research. *Frontiers in Human Neuroscience*, *11*(March), 1–14. https://doi.org/10.3389/fnhum.2017.00145

Fisher, W. P. (2007). Rating Scale Instrument Quality Criteria. *Rasch Measurement Transactions*.

Garrin, J. M. (2014). Role of the Fitness Professional in Social Change Agency. *Journal of Social Change*, *6*(1), 41–54. https://doi.org/10.5590/JOSC.2014.06.1.05

Haerani, S., Sumardi, Hakim, W., Hartini, & Putra, A. H. P. K. (2020). Structural model of developing human resources performance: Empirical study of Indonesia States Owned Enterprises. *Journal of Asian Finance, Economics, and Business*, *7*(3), 211–221. https://doi.org/10.13106/jafeb.2020.vol7.no3.211

Hau, Y. S., Kim, B., Lee, H., & Kim, Y. G. (2013). The effects of individual motivations and social capital on employees' tacit and explicit knowledge sharing intentions. *International Journal of Information Management*, *33*(2), 356–366. https://doi.org/10.1016/j.ijinfomgt.2012.10.009

Kanat-Maymon, Y., & Reizer, A. (2017). Supervisors' Autonomy Support as a Predictor of Job Performance Trajectories. *Applied Psychology*, *66*(3), 468–486. https://doi.org/10.1111/apps.12094

Karlimah, K., Andriani, D., & Suryana, D. (2020). Development of Mathematical Anxiety Instruments with a Rasch Model Analysis. *The Open Psychology Journal*, *13*(1). https://doi.org/10.2174/1874350102013010181

Korthagen, F. A. J., & Evelein, F. G. (2016). Relations between student teachers' basic needs fulfillment and their teaching behavior. *Teaching and Teacher Education*, *60*, 234–244. https://doi.org/10.1016/j.tate.2016.08.021

Leow, K., Lee, M., & Lynch Leow, M. F. (2016). *Big Five Personality and Depressive Symptoms: A Self-Determination Theory Perspective on Students' Positive Relationships With Others*. *January*, 0–9. http://selfdeterminationtheory.org/wp-content/uploads/2017/05/2016_Leow_etal_Vistas.pdf

Litalien, D., Morin, A. J. S., Gagné, M., Vallerand, R. J., Losier, G. F., & Ryan, R. M. (2017). Evidence of a continuum structure of academic self-determination: A two-study test using a bifactor-ESEM representation of academic motivation. *Contemporary Educational Psychology*, *51*, 67–82. https://doi.org/10.1016/j.cedpsych.2017.06.010

Marsden, K. E., Ma, W. J., Deci, E. L., Ryan, R. M., & Chiu, P. H. (2015). Diminished neural responses predict enhanced intrinsic motivation and sensitivity to external incentives. *Cognitive, Affective and Behavioral Neuroscience*, *15*(2), 276–286. https://doi.org/10.3758/s13415-014-0324-5

Martela, F., & Ryan, R. M. (2016). The Benefits of Benevolence: Basic Psychological Needs, Beneficence, and the Enhancement of Well-Being. *Journal of Personality*, *84*(6), 750–764. https://doi.org/10.1111/jopy.12215

Mueller, J. L. (2017). *Learning in Motion : Teachers " Perspectives on the Impact of Stationary Bike Use in the Classroom*. *16*(3), 15–28.

Nguyen, T. T., & Deci, L. E. (2016). Can It Be Good To Set The Bar High ? The Role of Motivational Regulation in Moderating the Link From High Standards to Academic Well-Being. *Journal Learning and Individual Differences*, *45*, 245-251. https://doi.org/https://dx.doi.org/10.1016/j.lindif.2015.12.020

Nishimura, T., & Suzuki, T. (2016). Basic Psychological Need Satisfaction and Frustration in Japan: Controlling for the Big Five Personality Traits. *Japanese Psychological Research*, *58*(4), 320–331. https://doi.org/10.1111/jpr.12131

Nota, L., Ginevra, M. C., Santili, S., & Soresi, S. (2014). *Psycho-social Career Meta-capacities: Dynamics of Contemporary Career Development* (M. Coetzzee (ed.)). Springer International Publishing. https://doi.org/10.1007/978-3-319-00645-1

Nur, L., Nurani, L. A., Suryana, D., & Ahmad, A. (2020). Rasch model application on character development instrument for elementary school students. *International Journal of Learning, Teaching and Educational Research*, *19*(3). https://doi.org/10.26803/ijlter.19.3.24

Planinic, M., Boone, W. J., Susac, A., & Ivanjek, L. (2019). Rasch analysis in physics education research: Why measurement matters. *Physical Review Physics Education Research*, *15*(2). https://doi.org/10.1103/PhysRevPhysEducRes.15.020111

Ramdani, R., Hanurawan, F., Ramli, M., Lasan, B. B., & Afdal, A. (2020). Development and Validation of Indonesian Academic Resilience Scale Using Rasch Models. *International Journal of Instruction*, *14*(1). https://doi.org/10.29333/IJI.2021.1417A

Renaud-Dubé, A., Guay, F., Talbot, D., Taylor, G., & Koestner, R. (2015). The relations between implicit intelligence beliefs, autonomous academic motivation, and school persistence intentions: a mediation model. *Social Psychology of Education*, *18*(2), 255–272. https://doi.org/10.1007/s11218-014-9288-0

Rusmana, N., Suryana, D., Kurniasih, H. S., & Almigo, N. (2020). The development of speaking Skill's instrument in elementary school with Rasch model analysis. *Universal Journal of Educational Research*, *8*(7). https://doi.org/10.13189/ujer.2020.080702

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R. M., & Deci, E. L. (2000b). *Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being*. *55*(1), 68–78.

Ryan, R. M., & Deci, E. L. (2005). Toward a social psychology of assimilation: Self-determination theory in cognitive development and education. *Self-Regulation and Autonomy: Social and Developmental Dimensions of Human Conduct*, 191–207. https://doi.org/10.1017/CBO9781139152198.014

Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: does psychology need choice, self-determination, and will? *Journal of Personality*, *74*(6), 1557–1585. https://doi.org/10.1111/j.1467-6494.2006.00420.x

Ryan, R. M., & Deci, E. L. (2017). *Self-Determination Theory [Basic Psychological Needs in Motivation, Development, and Wellness*. The Guilford Press. https://www.guilford.com

Ryan, R. M., Soenens, B., & Vansteenkiste, M. (2019). *Reflections on self - determination theory as an organizing framework for personality psychology : Interfaces, integrations, issues, and unfinished business*. *September 2018*, 115–145. https://doi.org/10.1111/jopy.12440

Silva, M. N., Marques, M. M., & Teixeira, P. J. (2014). Testing theory in practice: The example of self-determination theory-based interventions. *The European Health Psychologist*, *16*(5), 171–180.

Stout, J. L., Gorton, G. E., Novacheck, T. F., Bagley, A. M., Tervo, R. C., Bevans, K., & Tucker, C. A. (2012). Rasch analysis of items from two self-report measures of motor function: Determination of item difficulty and relationships with children's ability levels. *Developmental Medicine and Child Neurology*. https://doi.org/10.1111/j.1469-8749.2012.04231.x

Sumintono, B. (2018). *Rasch Model Measurements as Tools in Assessment for Learning*. https://doi.org/10.2991/icei-17.2018.11

Taufik, A., Yudha, E. S., & Suryana, D. (2019). *The Raven's s Advanced Progressive Matrices in Education Assessment with a Rasch Analysis*. *7*(9), 1996–2002. https://doi.org/10.13189/ujer.2019.070921

Trenshaw, K. F., Revelo, R. A., Earl, K. A., & Herman, G. L. (2016). Using Self Determination Theory Principles to Promote Engineering Students' Intrinsic Motivation to Learn. *Publish.Illinois.Edu*, *32*(3), 1194–1207.

http://publish.illinois.edu/glherman/files/2016/05/2016-IJEE-IM-Relatedness.pdf

Vansteenkiste, M., & Sheldon, K. M. (2006). There's nothing more practical than a good theory: Integrating motivational interviewing and self-determination theory. *British Journal of Clinical Psychology*, *45*(1), 63–82. https://doi.org/10.1348/014466505X34192