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Scale Validation *of Self-Regulated Learning*

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Abstract

Students' ability to manage themselves during the learning process is essential for development. This research examines student behavior in completing academic assignments due to a lack of discipline and self-control in regulating their learning activities. This research is crucial for developing students' self-management skills in relation to the learning process. The purpose of this study is to develop a scale self-regulated learning with psychometric tests. This research uses a model confirmatory factor analysis (CFA) with the program. AMOS is done because the scale items are built from existing constructs, namely from self-regulated learning Zimmerman's Social Cognition. Therefore, CFA was done because the items were prepared to be used in the Indonesian context, so the scale's validity needed to be tested. Scale development self-regulated learning. This research is concerned with students' ability to prepare themselves for learning. The subjects of this study were 70 students from Makassar State University. The final selection results of the scale consisted of 21 items and loading factor ≥ 0.5 with good reliability, namely AVE = 0.753 (more than 0.50) and composite reliability = 0.955 (more than 0.70).

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1. INTRODUCTION

Studying at university demands students' independence in managing themselves if they want to graduate well and on time. This is because self-regulated *learning*(independent learning) is thought to influence success in learning (Smith, 2001). For this reason, students who have *self-regulated learning. A* good student will certainly be more capable of mobilizing, organizing and motivating himself in learning, and will be able to determine goals, use effective learning strategies and plan the desired goals. On the other hand, students who have self-regulated *learning, those* who are lacking will often fail to establish effective learning techniques (Eerde, 2000).

The existing facts show that most students in their learning activities do not plan, organize, monitor and evaluate their learning, as a result they prefer to procrastinate in doing assignments, doing assignments carelessly (*copy paste*) or simply leaving names, submitting assignments late, and often arriving late for lectures (Ilfiandra, 2008). These symptoms indicate that many students still lack the ability and skills to regulate themselves in learning activities. In fact, students, as individuals in their teenage years, theoretically already have self-regulated *learning* which is good (Wang, 2004).

Starting from the conditions *elf-regulated learning of* Indonesian students described above, and the researcher's experience in class in the Indonesian context, the researcher is

interested in looking further into the conditions/self-regulated *learning students* in Indonesia. Understanding this will certainly help researchers and other academics in Indonesia see the problem *self-regulated learning* contextually. Indonesia has such diverse cultures and generally the theories used are mostly derived from outside the Indonesian context, so how are the constructs used to measure self-regulated *learning still* needs to be adapted to the context of Indonesian students. Therefore, in an effort to understand the conditions, self-regulated *learning students*, researchers realized the need to develop measurement instruments that were truly appropriate to the Indonesian context. Therefore, in this study, the instrument developed was based on the Social Cognition approach (Zimmerman, 1989).

The influence of self-regulated *learning on* learning is shown in several studies. Cerino (2014) explains that there is a significant negative relationship between self-regulated *learning with* procrastination behavior with a correlation coefficient value of 0.174. Motiea, et,.al (2013) stated that the influence of self-regulated *learning* The effect of procrastination on academic procrastination was -0.239. They explained how to minimize procrastination by providing assistance in determining learning objectives, organizing learning materials, designing metacognitive strategies for time management, and motivating students to learn. Several studies have shown that self-regulated *learning*, one of the factors that influences low learning outcomes (Eerde, 2003; Wolters, 2003; Ferrari & Tice, 2000).

Students who have *self-regulated learning in* learning does not require extrinsic motivation *in* doing the job. Students who have *self-regulated learning those* with high self-efficacy are able to assess themselves and re-examine the tasks they have completed, thereby minimizing academic procrastination behavior, as indicated by a correlation coefficient value of 0.384 (Behrozi, et. al, 2013). Furthermore, students who have high self-efficacy are able to assess themselves and re-examine the tasks they have completed, thus minimizing academic procrastination behavior, as indicated by a correlation coefficient value of 0.384 (Behrozi, et. al, 2013). *Self-regulated learning in* learning, able to develop strategies, evaluate, motivate oneself and use time well so as to improve learning outcomes, in this study the influence of self-regulated *learning with* learning outcomes of r^2=square 0,352, (Kelly, 2015).

Self-regulated learning is Effective learning will contribute positively to academic achievement. Students are expected to be disciplined and disciplined in their studies. This discipline includes arriving on time for lectures, taking lectures seriously, asking questions and discussing lecture material, visiting the library, completing assignments well, and not procrastinating (Schunk, D. H. & Ertmer, 2000). Furthermore, students who have self-related *learning* (independent learning) are able to determine goals, work targets, choose good strategies, motivate oneself and evaluate learning activities (Schunk, 1990). A number of studies show that self-related *learning* has a positive influence on academic success (English, & Kitsankas, 2013; Zimmerman, 2000). However, in reality, students' inability to manage self-related *learning* resulting in learning difficulties, low motivation, low academic achievement and procrastination behavior in academic tasks (Akinsola, & Tella, 2007; Asikhia, 2010; Burka, & Yuen, 2008a; Ellis, & Knaus, 1998; Ferrari, Johnson, & McCown, 1995; Tice, & Baumeister, 1997; Zimmerman, & Schunk, 2012).

Self-regulated learning is an independent learning process that has three dimensions, namely; (a)*Strategy cognition,* (b) *Strategy Motivationally* (c) *Strategy Behaviorally active participants*. Furthermore, *Strategy cognition includes* the process and understanding in order to realize individual alertness and awareness and knowledge in achieving the learning process which is one of the strategies in the thinking process. Metacognitive abilities support the process *self-regulated learning by* planning, setting goals, monitoring,

organizing and evaluating various activities during the process of qualifying individuals. *Strategy Motivationally* that is, someone who has motivation is an individual who can focus on the importance of extraordinary effort and perseverance in learning. inside *self-regulated learning,* motivation is a characteristic situation that shows self-efficacy high, and self-characteristics and interest in the task. The perception of students being able to complete the task and the potential for students to achieve success and have the courage to face failure, and finally *Strategy Behaviorally active participants* Active participation behavior is a response influenced by several processes, such as good behavior displayed in an environment. Active participation behavior is behavior that can be observed and developed through interaction in the environment. The behavioral process in self- *regulated learning* includes selecting, arranging and creating an environment for learning. Students also practice skills and strengthen the formation of performance. Based on these concepts, the dimensions that will be used as constructs to understand students' abilities in self-management are: *Strategy cognition*, *Strategy Motivationally* and *Strategy Behaviorally active participants* (Zimmerman, 1989). This model was chosen to determine students' ability to reconstruct themselves during learning. To understand this, a measuring instrument with good validity is required. Therefore, the researchers in this study conducted a series of psychometric tests to obtain measurements that truly fit the Indonesian context and culture. One of them is measurement/self-*regulated learning.*

Validity means the extent to which a measuring instrument accurately and precisely performs its function as a measuring instrument (Kline, 2011). A scale measurement can be said to have high validity when the measuring tool carries out its measurement function, or provides measurement results that are suitable for the purpose of test measurement that produces data that is suitable for the purpose of measurement. Valid measuring tools are those that have small *variants error*, so that the resulting numbers can be trusted as actual numbers or close to the actual situation (Azwar S., 2012).

From In the field of psychology, the term validity is used in at least three contexts, namely: 1) research validity, b) question validity, and c) validity of measuring instruments or tests (Azwar S., 2012). Furthermore, construct validity is included in the validity of measuring instruments or tests (Kline, 2011). Construct *validity.* The aim is to determine whether the scores from the measuring instrument are able to reflect the theoretical construct underlying the measurement instrument's development. This validity test will use a quantitative analysis.*CFA*The relationship between factors will provide information about whether the measuring instrument has similarities with the objectives, thereby reducing the number of variables that must be handled by the researcher.

2. METHOD

The development of this instrument was carried out in accordance with the preparation of the psychological scale as explained by (Azwar S., 2012), namely: 1) theory identification, 2) conceptualization, 3) operationalization, 4) construction, 5) content validity test, 6) construct validity test with the model confirmatory *factor analysis* (CFA), 7) reliability testing and 8) final scale development. The stages carried out in developing this instrument are first, defining the construct Individual analysis was carried out by operationalizing the construct, searching for literature and articles as references, identifying the instruments used, developing new scales, and conducting evaluations (Hair. J.F., et al., 2014). The data collection technique in this study used a scale. A scale is a method of data collection using a list of questions. answered by subject. This scale is intended for scale measurement *self-regulated learning*. The characteristics of the subjects in this study are students of Makassar State University class of 2017 who are still registered as students, totaling90 students. The sampling technique used technique *multistage proportional*

random sampling. This is because all respondents had an equal opportunity to be used as research samples, and the number of samples per faculty was also taken into account. Furthermore, each sample was selected using a simple random sampling method, taking into account the characteristics of the Makassar State University student population (Rusdi et al., 2020).

The development of the measuring instrument used in this research is to construct *regulated learning which* has three dimensions, namely, *strategy cognition, strategy motivation and strategy behavioral* (Zimmermann, 1989). This scale has a format *response* Which ranging from strongly agree (SS), agree (S), undecided (RG), disagree (TS) and strongly disagree (STS). In the answers to the items *favorable* strongly agree is given a score of (5), agree answers are given a score of (4), uncertain answers (RG) are given a score of (3), disagree answers are given a score of (2) and strongly disagree answers are given a score of (1). Meanwhile, in the unfavorable the answer strongly agree is given a score of (1), the answer agree is given a score of (2), the answer doubt is given a score of (3), the answer disagree is given a score of (4) and the answer strongly disagree is given a score of (5). If the score obtained is higher, it can be said that the student has a higher ability to organize himself in the learning process. Conversely, if the score obtained is low, then self-regulation students can be said to be low.

3. RESULTS

Before doing *pilot study* or instrument trials, researchers carry out validation procedures which are carried out by expert testing or item review (*content validity*). This scale was consulted in depth to experts (*expert judgement*) to conduct an item review.

table. 1. ***Blue print scale self-regulated learning***

No	Aspect	Item
1.	***Strategy cognition***	Fav: 1. When there is a lecture, I make a summary of the material in my own words to help me understand. 2. I explain the lecture material to my classmates 3. When there is a lecture going on, I try to pay full attention. 4. When the lecturer repeats the lecture material, I feel happy. 5. When a lecture is taking place, I feel able to understand the lecture material presented by the lecturer. 6. I am optimistic that I will be able to complete my studies on time. 7. When the lecture was going on, I asked about things that I didn't understand. 8. I treat the lecture material as a first step to develop the ideas I have with the material. 9. When I study a course, I reread the class notes and summarize the important material. Untav; 10. During class I missed an important point because I was thinking about something else. 11. When the lecturer teaches by repeating the material, I feel bored or annoyed. 12. When asked to present to friends, I felt pessimistic 13. When studying the lecture material, I didn't really understand what the material meant. 14. I directly copied without changing the sentences from the theory that I got from the lecture material. 15. When the lecture was going on, I felt lazy and it made me stop before finishing what I had planned. 16. When the lecture was taking place, I had difficulty studying the lecture material. 17. During the lecture, I was too lazy to ask questions when there was something I didn't understand. 18. I am pessimistic about being able to complete my studies in eight semesters.

2.	***Strategy motivation***	Fav:	
		19.	I work hard to do well in a course, even if I don't like the course.
		20.	I ask myself to make sure whether I have understood the lecture material in class.
		21.	I want to graduate on time, so I am disciplined in doing academic assignments.
		22.	I am fully concentrating on completing my assignments on campus.
		23.	When reading lecture material, I try to connect the material I already know.
		24.	I try to apply ideas from the lecture material to other activities such as classroom learning activities and discussions.
		Unfav:	
		25.	I am I feel that my efforts are in vain and this makes me give up easily in completing academic assignments.
		26.	When there is a difficult task, I give up on it or just study the easy part.
		27.	I was working on a paper writing assignment; I remembered that my writing was bad and it made me lose motivation to continue.
		28.	I have a hard time focusing on academic assignments, so I just leave them.
		29.	I am less able to connect the lecture material in class
		30.	I try to play around with my own ideas related to what I learned in lectures.
3.	***Strategy Behavior***	Fav:	
		31.	I usually study in a place where I can concentrate on doing academic assignments.
		32.	Every time I can study well to complete academic assignments
		33.	If I am confused with the notebook I made, I will tidy up the notebook so that it can be understood.
		34.	When I don't understand the material in a course, I ask the lecturer and other students in the class to help me.
		Unfav:	
		35.	I don't have enough time to study
		36.	When studying in a crowded place, I can't focus on doing my college assignments.
		37.	I rarely take the time to re-read my study handicap book before the test
		38.	When I encounter difficulties in doing academic assignments, I just keep quiet.

1. Validity Test of Measuring Instruments

This study uses content validity testing. The technique is through professional *judgement/against* the instruments that have been prepared. This scale is consulted with experts (*expert judgement*) to conduct item review. Expert testing was conducted through consultation between the researcher and lecturers from the Faculty of Educational Sciences, lecturers from the Faculty of Educational Psychology. Expert testing for the item review of the measuring instrument was also conducted by the Dean of the Faculty of Educational Psychology and lecturers from educational psychology from outside the State University of Malang. In addition to the expert testing, the researcher also conducted a readability test on two doctoral students in educational psychology. The assessment showed that there was a match between the items and the constructs used as measuring instruments, then the items that passed the expert validation were then rearranged according to blue *which* had been designed previously.

The next stage is to develop and specify the measurement model. This measurement model specification is done using *measurement relationship* for the items and their constructs, correlation relationship and error for the items (Hair. J.F., et al , 2014)

The instruments in this study were carried out using confirmatory analysis or confirmatory factor analysis (CFA) with program AMOS test is carried out to match whether the items and aspects have become indicators cofferer in accordance with the research construct (Ghozali, 2014; Hair. J.F et al, 2014). The final selection result for each instrument is if the item has factor loading≥ 0.50, and t-value ≥ 1.96 with

good reliability is AVE ≥ 0.50 and construct reliability≥ 0.70 (Ghozali, 2005; Hair. J.F., et al, 2010).

2. Reliability Test of Measuring Instruments

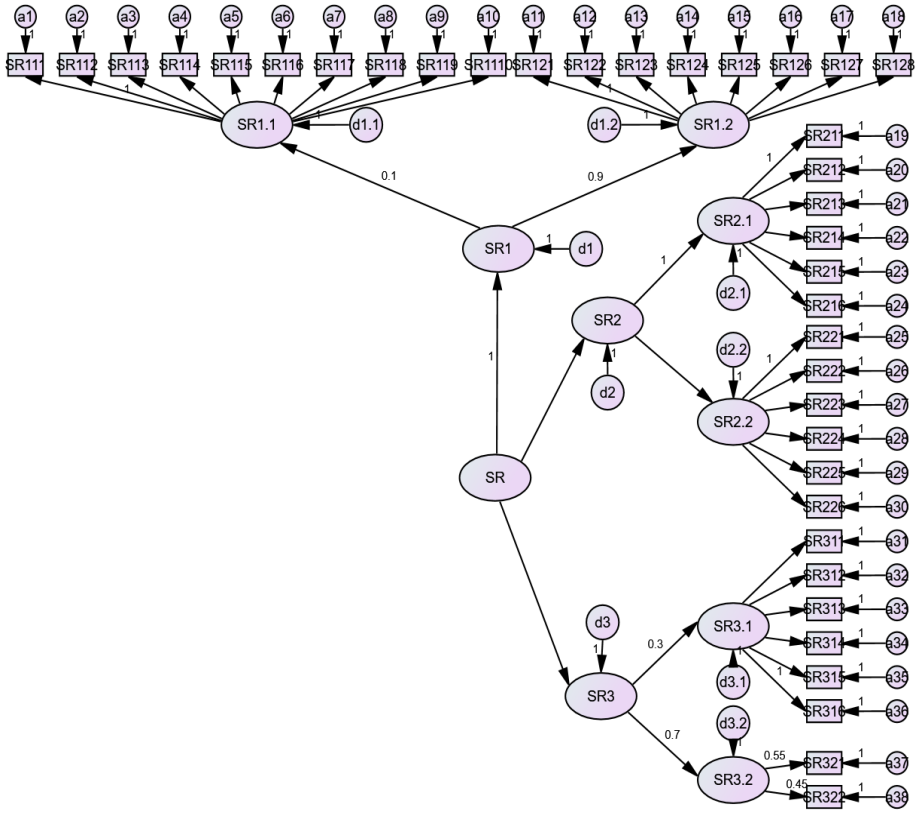

Figure 1 initial scale model *Self-Regulated Learning*

Scale analysis/self-regulated *learning consists* of two stages. The image above represents the initial stage, where each item in each dimension is still complete. Dimension/strategy *cognition consists* of 2 indicators and 18 items. Each item has *loading factor* between 0.086 – 0.653. Dimensions *strategy motivation* has 2 indicators and 12 items with *loading factor 0.010* – 0.783, while the dimensions/strategy *behavior also* has 2 indicators and 8 items with *loading factor*0.370 – 0.572. To get the value good *loading factor*, then the next stage is carried out, namely throwing away items that are still low. The following are the results of the second stage of analysis.

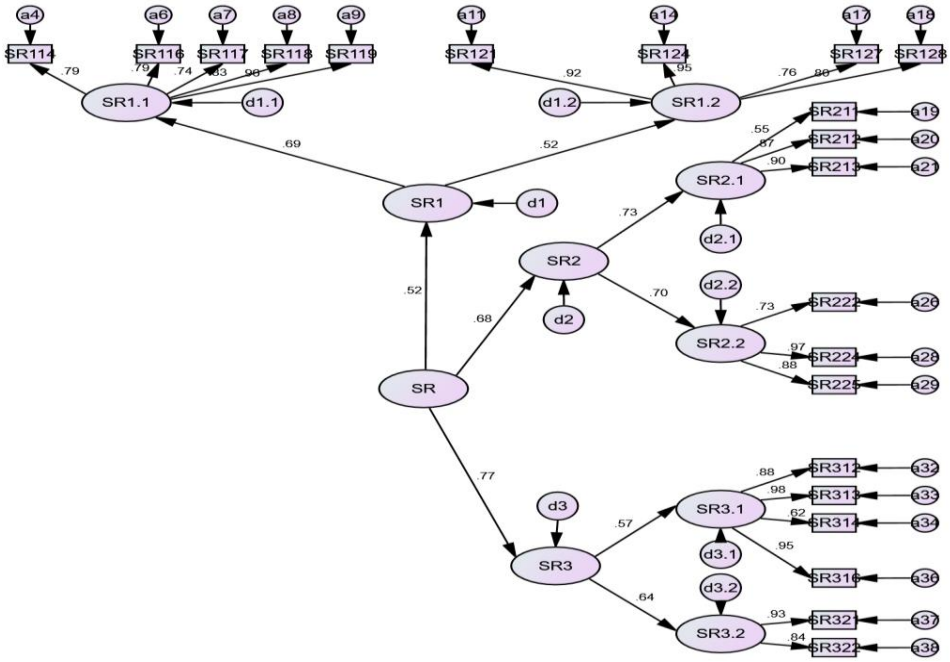

Figure 2. Final scale model *self-regulated learning*

This image shows the final stage because each dimension has met the criteria. *Loading factor* which was determined by the researchers, namely *loading factor*≥ 0.5. Dimensions *strategy cognition* consists of 9 items; each item has *loading factor* 0.743 – 0.964. Dimensions/strategy *motivation consists* of 6 items with a value *loading factor*0.547 – 0.973 and dimensions *strategy behavior* consisting of 6 items with a value between 0.622 – 0.979. The results of the validity and reliability of the scale item selection self-*regulated learning.*

Table 2. Final stage of the scale *self-regulated learning*

Dimensions	Selected items	*Loading factor* (λ)	*Average Extracted*	*Composite Reliability*
cognition	Item SR114	0,788		
	Item SR116	0,789		
	Item SR117	0,742		
	Item SR118	0,831		
	Item SR119	0,964		
	Item SR121	0,922		
	Item SR124	0,949		
	Item SR127	0,762		
	Item SR128	0,801		
Motivation	Item SR211	0,547		
	Item SR212	0,866		
	Item SR213	0,899		
	Item SR222	0,731		
	Item SR224	0,973		
	Item SR225	0,876		
Behavior	Item SR312	0,883		
	Item SR313	0,979		
	Item SR314	0,622		
	Item SR316	0,951		
	Item SR321	0,926		
	Item SR322	0,835		
Reliability value			**0,753**	**0,955**

The final selection results were 21 items,*loading factor*has a value of more than 0.50 with good reliability, namely AVE = 0.753 (more than 0.50) and composite *reliability*= 0.955 (more than 0.70).

Table 3.*Blue print* scale of *self-regulated learning* after *CFA* analysis

Dimensions	Description	Item number	
		Before	**After**
Strategy cognition	Repeating lesson material, writing notes, memorizing and building information from various sources of lesson material	1,3,5,8,15, 6,7,20,32 12,13,14,26,38 4,9,16,36	8, 12,13, 14,26,6,32, ,16,36
Strategy motivation	increase motivation from within the individual in carrying out academic tasks	17,24,28, 31,34,19, 27,29,33 30,35,37	17,24,28,34 30,35
Strategy behavior	Individuals can organize their time and place of study, making the learning process easier by making a schedule.	2,10,11 22, 18,21,25 23	10,11,18,25,22, ,23
	Total	**38**	**21**

The following describes the form of the remaining statement items from the results of the validity and reliability analysis of the scale. *Self-regulated learning*:

Table 4. final items*self regulated learning after* CFA analysis

No	No. item	Statement
1	8	When the lecturer repeats the lecture material, I feel happy.
2	12	During class I missed an important point because I was thinking about something else.
3	13	When the lecturer teaches by repeating the material, I feel bored or annoyed.
4	14	When asked to present to friends, I felt pessimistic
5	26	When studying the lecture material, I didn't really understand what the material meant.
6	6	I am optimistic that I will be able to complete my studies on time.
7	32	When I study a course, I reread the class notes and summarize the important material.
8	16	During the lecture, I was too lazy to ask questions when there was something I didn't understand.
9	36	I am pessimistic about being able to complete my studies in eight semesters.
10	17	I work hard to do well in a course, even if I don't like the course.
11	24	I ask myself to make sure whether I have understood the lecture material in class.
12	28	I want to graduate on time, so I am disciplined in doing academic assignments.
13	34	When reading lecture material, I try to connect the material I already know.
14	30	I have a hard time focusing on academic assignments, so I just leave them.
15	35	I am less able to connect the lecture material in class
16	10	Every time I can study well to complete academic assignments
17	11	If I am confused with the notebook I made, I will tidy up the notebook so that it can be understood.
18	18	I don't have enough time to study
19	25	I rarely take the time to re-read my learning disabilities book before a test
20	22	When I don't understand the material in a course, I ask the lecturer and other students in the class to help me.
21	23	When I encounter difficulties in doing academic assignments, I just keep quiet.

4. DISCUSSION

The findings showed that scores on the 38 items on the scale *self-regulated learning*,21 items have high reliability, this shows that students are quite aware of their

tendencies in understanding the construct. *Self-regulated learning*. to know the degree of suitability of the psychometric items in the instrument.

Description *self-regulated learning is* highly important to many people. The complex problems faced range from the simple to the broadly complex, for example, changing jobs (due to numerous mismatches), students' failure to achieve academic achievement, students who feel frustrated with their college assignments, demands for new learning that must be initiated and directed by themselves, and these are the facts that occur among students in Indonesia. With this scale, it can provide enlightenment in understanding the broad construct *self-regulated learning about* the importance of understanding self-awareness in achieving success in life.

Helping students develop self-regulating learning skills is an important goal in various social cognitive theories. Therefore, this scale can provide solutions and benefits for the development of behavioral development. *Self-regulated learning*. The view of social cognitive theory on self-*regulated learning is* that students who have self-*regulated learning in* the learning process effectively tend to be better than students who have less self-*regulated learning*. Students who have self- *regulated learning demonstrated* through three activities, namely: 1). Students set challenging, yet achievable goals for themselves. 2). Students select and establish effective strategies to achieve their goals. 3). Students implement strategies. *self-regulated learning to* motivate and guide during the learning process (Bandura, 1988; Fetsco, & McClure, Zimmerman, 1994; Schunk, 1990). Challenges for learners in the context of*self-regulated learning*are: 1). Against enjoyable activities, watching television, playing games, etc. 2). Minimal understanding of how to learn well, 3). The quality of learning is difficult to assess, and 4). Lack of attention, appreciation, retention, and self-awareness as attributes of students who have self-regulation (Zimmerman, & Moylan, 2009).

5. CONCLUSION

Based on the findings of the research results, the scale self-*regulated learning which* consists of 38 items, the final selection scale consists of 21 items and loading *factor* ≥ 0.5 with good reliability, namely AVE = 0.753 (more than 0.50) and composite reliability = 0.955 (more than 0.70). Validation of this instrument is used for development and evaluation of students to understand the picture. *Self-regulated learning* that it has, besides that it is also necessary to know the degree of suitability of the psychometric items in the instrument in defining the construct.

Students who have *Self-regulated learning* high indicates high assessment (*score*) on a scale *Self-regulated learning*. On the other hand, students who have *Self-regulated learning* which is low in the learning process then evaluation (*score*) shakes *self-regulated learning also* getting lower. This gives an idea that the scale *self-regulated learning.* This can be used as inspiration for further researchers.

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