Self Regulated Learning of Mathematics Education Students of Bung Hatta University

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Self Regulated Learning of Mathematics Education Students of Bung Hatta University

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Abstract. This study aimed to analyze the level of Self-Regulated Learning(SRL) on the material Differential Calculus of Mathematics Education students of Bung Hatta University. This research method using descriptive qualitative method. Subjects were students taking courses Differential Calculus. To obtain research data used questionnaire instrument SRL with indicators; (1) Not dependent on the others, (2) Have confidence, (3) Conduct discipline, (4) Having a sense of responsibility, (5) Conduct on its own initiative, and (6) Exercises self-control. By taking a sample of 24 students showed that 12.5% low , 79.17% medium and 8.33% high level. While the outcomes per indicator shows that students tend to be at the low category (below 60%). These results are consistent with the interview of six students who have of high, medium and low learning ability.
Keywords: SRL, Qualitative Research, Level of SRL

1. Introduction

Student Center Learning is an active learning and filled with an atmosphere of high learning activities. One of the characteristics SCL is shown by the Self Regulation of learning. Regulation of the Minister of Education and Culture of the Republic of Indonesia number 44 in 2015 on SNPT chapter 11 verse 10 states that learning should be centered on the student, which means that the achievement of learning graduates achieved through a learning process that promotes the development of creativity, capacity, personality, the students' needs, and to develop self regulated in order to find knowledge. According to Bandura (1986) in [1] stated that Self Regulated Learning (SRL) involves three processes: self-observation, self-assessment and self-reaction. Self-observation involves attention to certain aspects of the person's behavior such as self-monitoring of progress towards the achievement of objectives; track the number of math problems completed correctly or The strategy is used to assist in reading comprehension. Self-assessment involves comparing an individual's performance standards. Reaction themselves, such as self-efficacy about one's ability to successfully perform a task, the result of the conclusions towards achieving objectives or performance. The third process is cyclical and affect performance in the future.
Meanwhile, according [2] convey the characteristics that distinguish students who are learning with SRL or not; a) They know how to use cognitive strategies (rehearsal, elaboration and organization) that helps them to process, elaborate, and store information. b) They know how to plan, control, and direct their mental processes to achieve their personal goals (metacognition). c) They present adaptive motivational beliefs and emotions such as: a sense of high academic ability, the adoption of learning objectives, the development of positive emotions for tasks (pleasure, satisfaction, enthusiasm, etc.) as well as the capacity to control and modify it. d) They plan and control the time and effort to be used in the task. They know how to create and compile a pleasant learning environment (the right place to learn and find

teachers and colleagues when they run into trouble). e) If the context allows, they participate in the elections, control, and regulation of aspects related to academic work, the climate, and the class structure. f) They will make a different strategy, which aims to avoid the interference of external and internal to maintain concentration, effort, and their motivation for academic task execution. .

As a lectuter Calculus, there are some behavioral responses of students when they have studied, i.e; 1) .When there is provision of duty at home then not all students are working and collecting, 2) .Most of the students are often late in coming.3). Most of the tasks given, just copy the home work.4). When held to review the material by asking random questions, students often turn to the left and to the right side to invoke the help of friends. Likewise, when given a quiz or exam also behave similarly.

Learning attitude shown by this, especially calculus, of course, can not contribute to a good understanding. Calculus contain materials that are abstract and very thick with symbols. Understanding of the concept must be supported by an understanding of other concepts first. Therefore teachers start teaching Calculus demanded a topic of the simplest concepts are further increased to more difficult topics. In addition, the teachers are also required to interpret the concept of Calculus into real situations in daily life even if the need to use the media and tools in learning. Other facts relating to the first year of learning Calculus seen that Calculus teachers feel difficulty in learning. Especially first-year students often do not work on a job on the grounds do not know to do it. Students do not understand the material prerequisites Calculus, such as the ability of algebra, geometry, trigonometry, and functions. Students can not learn independently when given the material and teaching materials in the form of Calculus Hand out and Textbooks. Students do not respond and reading material in the home when given a topic for discussion, so that at the next meeting when carried out a review of the material and then, almost no students who answered correctly .

Table 1. Results of studying Calculus in FKIP-UBH the last two years.

Department	Academic year	Percentage of Learning outcomes				
		A	B	C	D	E
Mathematics Education	2015/2016	2.9	14.3	54.3	22.9	5.6
	2016/2017	5.9	23.5	26.5	41.2	2.9
Information Technic and Computer Education	2015/2016	20	50	23.6	0	6.4
	2016/2017	0	22.2	66.7	0	11.1

Table 1 shows that there was a downward trend in the value of student presentations with good category (B) and excellent (A). This value is the target achievement of the strategic planning department of the yield grade point average (GPA) of students with an average of 3.00. In addition, to maintain their GPA in the first year so as not to fall due to unfavorable calculus grades. So to reduce of the opportunity to take credits are optimal for the next semester. Indirectly of course to keep the student in order not to repeat so that students can graduated their studies on time. Based on the symptoms that are seen in the background of the issues raised in this study is how to describe the degree of independence of student learning in the subject of Mathematics Education in Guidance and Counseling Calculus Bung Hatta University Padang.

Definition of Self Regulated Learning (SRL) in a large dictionary Indonesian ie, derived from the word independent, is a state that can stand alone, not dependent on others. While the notion of independence is a matter or circumstance can stand on its own without relying on others. Another notion of independence is as attitude (behavior) and mentally which allows one to act freely, correct, and useful; trying to do everything honestly and correctly instigation himself and self-management, in accordance with their rights and obligations, so as to solve the problems they face; and is responsible for all the decisions that have been taken through various earlier considerations. Furthermore, several SRL questionnaires have been designed and validated by several experts, including [3],[4],[5].

Several studies of SRL lately [6] analyze about the SRL that focus on the factors that influence SRL and student learning outcomes by implementing strategies SRL. Factors such as the use of cognitive

strategies, meta-cognition, self-efficacy and confidence more motivation and some individual differences consideration, and they derive a relationship between self-efficacy and self-regulated learning is real. Analyzing how training SRL strategies associated with increased knowledge, self-efficacy, perceived Utilization (perceived usefulness), and the effectiveness of its use in academic learning tasks. In addition to direct effects, they explore how various determinants interact directly and indirectly with each other. In his research design using pretest-posttest quasi-experimental to the students in the control group (n = 206) and the experimental group (n = 167). [7] study of formative assessment can support secondary students' self- regulated learning in English language learning . There are still a lot of development research of SRL to improve results and the learning process;[8], [9],[10],[11],and [12]. And there is a relationship between SRL and academic achievement, gender and others; ie [3], [6], [11], [13],[18], [19],

Based on the study of the various theories of SRL and its relationship with the student's activity in the classroom so that was formulated by six indicators of SRL were: (1) Not depend on the others, (2) Have self eficacy, (3) Behave discipline, (4) Having a sense of responsibility, (5) Behave on its own initiative, and (6) Exercise self-control.

2.Method

The method used is descriptive qualitative research as suggested by [20]. This type was chosen because it aims to describe the SRL of Mathematics Education students at the FKIP Bung Hatta University while attending lectures in Calculus. The subject was chosen purposively because it was in accordance with the purpose of the study.

Based on the concept descriptive research, the research procedure followed in stages or phases, ie:

1. The preliminary stage, Researcher observe the SRL students , making the indicators based on the literature review and prepare research instruments.
2. Implementation Phase, designing the SRL questionnaire and validating the Questionnaire (Item validation and item reliability) and distributing it to the students who are taking Calculus Courses.
3. Analysis stage, based on the results of a questionnaire and interviews with two students were divided into high, medium and low learning ability..

The quitionare use Liker scale (scale: 1 to 4) which is designed according to the theory of SRL indicators with grating as shown in Table 2.

Table 2. Questionnaire of SRL grid

No.	Indicator	Item number and type statement
1	Independence against others	1 (-) 4 (-), 6 (+), 16 (+)
2	Having confidence.	8 (+) 10 (-) 17 (+)
3	Behave discipline.	11 (+) 12 (-) 18 (+)
4	Having a sense of responsibility	7 (+) 13 (-) 14 (+)
5	Behave on their own initiative	2 (+) 3 (+), 5 (-) 20 (+)
6	Exercise self-control.	9 (+) 15 (-) 19 (+)

The indicators in table 2 are derived from the opinions of several previous experts. Initially, there were 20 positive and negative statements, but after being validated there were only 15 statements

The purpose of the study was to describe the level of SRL in Mathematic education students;

$$P = \frac{n}{N} .100\% \quad (1)$$

P = The percentage of the value obtained
n = Total scores obtained
N = The total score of the ideal value

The quantitative results of calculations based on formulas are modified and interpreted with qualitative sentences. SRL is interpreted by five criteria. The steps to determine the criteria level are carried out as follows:

1. Set a maximum percentage of (4: 4) x 100% = 100%
2. Set a minimum percentage of (1: 4) x 100% = 25%
3. Set a percentage range, percentage range is obtained by subtracting the highest percentage (100%) with the lowest percentage (25%) ie 75%
4. Specify the desired interval, ie Strongly Agree (SA), Agree (A), disagree (D), and Strongly Disagree (SDA).
5. Assign a percentage interval class length. Length of interval classes percentage obtained by dividing the percentage ranges with many criteria. The number of the criteria used is the number four criteria namely high, medium, low and very low so that the length of the class interval the percentage is 80%: 4 = 18.75%.
6. Establish levels of criteria, such as in Table 3;

Table 3. Criteria of Percentage SRL

No.	interval	Criteria / Category
1.	Score> 81.25%	High
2.	62.5% <Score≤81,25%	moderate
3.	43.75% <Score≤ 62.5%	Low
4.	Score≤43,75%	Very low

Result and Discussion

for the trial questionnaire, it is given to mathematics education students who take complex analyzes course. Table 3 is a questionnaire Indicators of SRL after the results of the validation instrument by using the item validity, which is the correlation of each item to the total score. With significance level of 0.05 by SPSS that resulted in 5 point statement is not valid, namely grain 3,4,6,7 and 12, with a reliability score of 0.93.

Furthermore, the questionnaire has been given to students amounting to 24 students. The results as shown in Table 4.

Table 4. Category of student SRL

Resp	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	Total	%	Criteria
1	2	4	2	3	2	4	2	4	3	4	3	3	3	4	2	45	75%	Medium
2	3	3	3	4	2	3	2	3	3	2	3	2	4	3	2	42	70%	Medium
3	3	3	3	3	3	2	2	2	3	3	3	2	2	3	2	39	65%	Medium
4	3	3	2	3	2	3	2	2	2	2	3	2	2	2	2	35	58%	Low
5	2	3	3	3	3	3	3	2	3	3	3	2	3	3	3	42	70%	Medium
6	2	2	2	3	3	3	2	3	3	3	3	2	3	3	3	40	67%	Medium
7	2	2	3	3	3	3	2	3	3	3	3	2	3	3	2	40	67%	Medium
8	2	3	3	2	2	2	2	3	4	2	3	3	4	3	3	41	68%	Medium
9	2	4	1	4	3	1	3	3	3	3	4	3	4	4	3	45	75%	Medium
10	3	4	2	3	3	4	3	3	3	4	4	3	4	4	2	49	82%	High
11	3	4	4	3	2	4	3	4	3	4	3	3	3	3	3	49	82%	High
12	2	3	2	3	2	3	2	3	3	3	3	2	3	3	2	39	65%	Medium
13	3	3	3	3	2	2	2	3	3	2	3	2	3	3	2	39	65%	Medium
14	3	3	3	3	1	3	2	2	3	2	3	2	3	3	2	38	63%	Medium
15	2	3	3	4	2	3	3	3	3	1	4	2	3	3	2	41	68%	Medium
16	3	4	2	3	2	3	3	4	4	4	3	3	4	3	3	48	80%	Medium
17	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	43	72%	Medium
18	2	3	3	4	3	3	2	4	3	4	4	2	4	4	3	48	80%	Medium
19	2	4	2	3	2	2	2	3	3	2	3	2	3	3	2	38	63%	Medium
20	1	3	2	3	2	2	2	2	2	2	4	2	3	3	2	35	58%	Low
21	2	3	3	3	3	3	2	3	3	3	3	3	3	3	3	43	72%	Medium
22	2	3	2	3	2	3	2	3	3	2	2	2	2	2	3	36	60%	Low
23	2	4	3	3	3	4	3	3	3	3	3	4	3	3	4	48	80%	Medium
24	2	4	1	4	3	3	4	3	4	2	4	3	4	3	3	47	78%	Medium

From Table 4 shows that the level of SRL at the level of Low (3), medium (19), and high (2). These results indicate that in general the middle category, only two (2) person who has particularly high category. The results of interviews with students based on midterm examinations at the level of low , medium and high ability for each of two students,look like table 5

Table 5. Results of Interviews on the SRL

Indicator	No.	Question	answer
Not dependence on the others	1	Anyone who helps you in everyday learning activities, especially the material Calculus? In the event that any aid is given?	Learning itself, though not understand, searching questions that are similar on the internet
	2	If nothing helps, material or any problems you can solve yourself.	Many materials / matter that is not understood. The basic concept of mathematics is not strong
behave Discipline	1	How do you work on assignments at home tuition	Do not have a specific schedule to learn at home. Try it yourself, searching the internet. How could have been. Seeing the work of a friend (discussion),
	2	What did you do to prepare to attend college as scheduled.	Almost never read the material at home. Learning when no homework.

			Never read the handouts and digital books given faculty.
Confidence	1	How is your chance to succeed / successful in this course	Not sure of success, but high powered sure success, not fond of mathematics.
	2	How do you to solve new problems that you've never met?	After searching the Internet, trying discussions with friends, but not completely.
	3	Barriers to what you find in understanding the material Calculus	The concept is not mastered basic math.
Having a sense of responsibility	1	What do you think each doing the coursework or exams?	Anxiety, (doubt), they speculate about, let go, wanted properties open book exam
	2	How is your attitude when receiving hasi Sheet studies each semester?	Disappointed, take for granted
Self-control	1	How do you react if the proposal / idea you are rejected by others	Keep the ideas, disappointed, someone asked basic rejection
	2	How is your attitude when the value of the task or your test score very ugly	Disappointed, in the course
Behave on their own initiative	1	What do you know about the Calculus?, Where and how do you know?	New entry PT know Calculus, although the material limits, derivatives, integrals never learn. But only a little.
	1	How is your chance to succeed / successful in this course	Not sure of success, but high powered sure success, not fond of mathematics.

Based on the interview for the first indicator, states that students learn by themselves, though not understood. Students just copy what they see on the internet or have friends. On the other indicators also occur in accordance with the results of the questionnaire, because they do not have the prior knowledge of mathematics stongly then they just follow the lecture pickup. Although They come to college on schedule, but they never repeat or have a specific time for studying Calculus. No initiative to catch up in learning, do learning only when it is given a task at home and it was also done the best, even with only copying his work. The percentage of each indicator of SRL had suistanable questionnaire can be seen in Figure 1

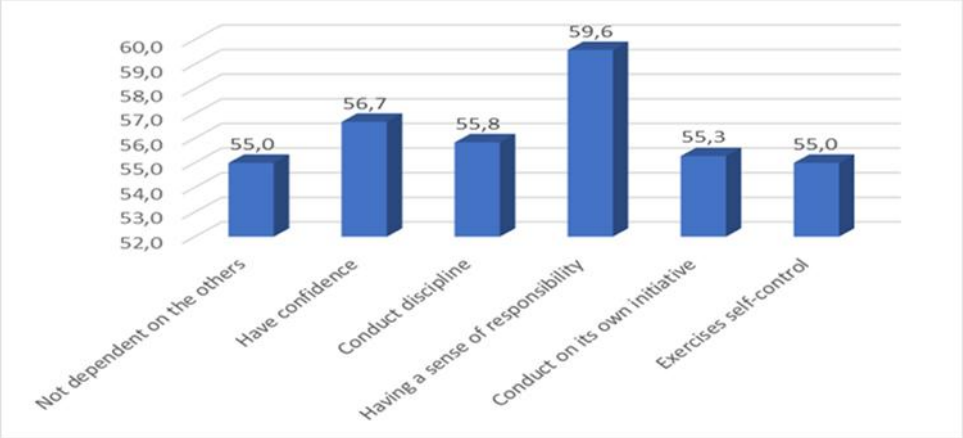

Figure 1. Percentage of SRL Indicator.

Figure 1 shows that the lowest indicator is an indicator 1 and 6, the students depend on the results of the work of others and lacking in self-control in the study. Generally speaking, the achievements per indicator is still below 60% is low and it can be concluded that the students were in the category of low or deficient in independent learning. Based on the above it is necessary to do some effort to train the student independence in learning. [8] noted the importance, prior knowledge (proir knowledge) because it has a large effect on the SRL and student performance. While [7] has conducted formative assessment (formative assessment) to support SRL students in learning English.

Conclusion

Based on the questionnaire results concluded that there are three people (12.5%) is at Low level, 19 (79.17%) at Medium level, and 2 (8.33%) higher category. This illustrates that the level of SRL that is still somewhat less good then need to design a learning model SRL which can increase the level of SRL of students with high category to more than 80%.

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