CORRELATION BETWEEN SELF-REGULATED LEARNING AND ACADEMIC ACHIEVEMENT OF CHEMISTRY EDUCATION STUDENTS OF FKIP SRIWIJAYA UNIVERSITY

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Abstract

The objectives of this research are to identify the self-regulated learning, academic achivement, the mostly used aspects of self-regulated learning, and the correlaction between the self-regulated learning and academic achievement of chemistry education students of FKIP Unsri. This research is acorrelational study. The sample of this research is the 72 students of chemistry education chosen randomly. The data were gathered by using questionnaire and documentation. The results of this research showed that the chemistry education students had high self-regulated learning, highly satisfied GPA and mostly used 5 out of 7 aspects of self-regulated learning. The statistical analysis showed that there was no significant correlation between self-regulated learning and academic achievement of chemistry education students. However, one out of the 7 aspects of self-regulated learning—evaluting the effectiveness--correlated significantly to the students' academic achievement.

Key words: correlation, self-regulated learning, academic achievement

1. Introduction

The rapid developement of science and technology has given a huge impact on many aspects of human life. Therefore, the ability to use their potential, appropriate strategies, and control their emotion will become one of important factors in supporting someone's success including in their academic life.

Self regulated learning is someone ability to control all aspects of learning capacity starting from planning to evaluating the result of their learning (Bruning et al, 2004, p. 117). Zimmerman (1990) in Bruning et al, 2004, p. 117) adds that

the theory of self-regulated learning consists of three main components, they are metacognitive awareness, the use of strategies, and motivation control. In addition, Bruning et al (2004, p. 117) add that metacognition includes knowledge and regulation about thinking capacity atau cognition. These two capacity allow a person to choose the best strategy and monitor its effectiveness with high accuracy. Another important part of the metacognition awareness is planning where students could determine the goals, planning on how to reach the goals, and evaluate the resuls periodically. Students who involve in effective planning usually have more opportunities to be successful (Pintrich, 2000; Zimmerman, 2000 dalam Bruning, 2004, p. 117).

Strategy is an important part of self-regulation learning because it provides clues on how someone identify, represent, and remember information. Students who are good at choosing the strategies effectively and monitoring the effectiveness during the learning process will learn better (Zimmerman & Martinez-Pons, 1990 dalam Bruning, 2004, p. 118). In addition, strategies will also help students to use the limited facilities efficiently.

Motivation control is an ability to determine the goals, evoke positif beliefs about someone's capacity and performance, and adjust themselves emotionally to their learning requirements. The skillful learrners understand the effort and strategies in learning. On the other hand, the unskillful learners perceive the bad learning achievement as a result of the uncontrol factors, such as ability and luck. The skillful learners are also able to put aside the things which can deteriorate concentration during their learning (Presley et al, 1987 dalam Bruning, 2004, p. 118).

The results of some previous research showed that self-regulated learning is very important in academic achievement. Zimmerman & Martinez-Pons (1986) report that there is correlation between learning stratgies of the high school students and their academic achievement. This is inline with Harris et al in

Zimmerman (1990) who found that training on self-regulated learning not only help to improve learning achievement but also improve their self-efficacy. Kosnin (2007) found that there is significant correlation between self-regulated learning of 460 engineering students at University of Technology Malaysia. Furthermore, Pintrich and De Groot (1990) also found that self-efficacy and intrinsic value correlated significantly with cognition and someone's performance. In addition, the regression analysis results also showed that self-regulation, self-efficacy, and test anxiety are the best predictors for someone's performance.

Although the results of some researches showed that self-regulated learning is one of the predictors of someone's academic achievement, the students' achievement especially in science, still showed the unexpected results. The results of PISA test (Program for International Students Assessment) in 2015 showed that among the 76 participating countries, Indonesia is among the countries with the lowest achievement especially in reading, science, and mathematics—rank 69th especially in science. Therefore, this research will identify the self-regulated learning in relation to the academic achievement of the chemistry education students of FKIP Unsri by focusing on the following research questions: how is the students' self-regulated learning, how is the students' academic achievement, which aspect of self-regulated learning mostly used by the students, and is there any significant correlation between self-regulated learning and academic achievement of the chemistry education students of FKIP Unsri.

2. Theoritical Background

2.1. Self-regulated learning

Zimmerman (1990) states that "the definition of students' self-regulated learning involves features such as their use of self-regulated learning strategies, their responsiveness to self-oriented feedback about learning effectiveness, and their interdependent motivational process" (p. 6-7). In other words, self-regulated learning is not a one mental state but it involves several ways of thinking which

can help the learners to be more effective in their learning, such as learning strategies, self-oriented feedback, and motivation.

Furthermore, Zimmerman (1990) describe self-regulated learners as those who have these three distinctive characteristics, such as 1) involving in metacognitive process, e.g., planning, setting goals, organizing, self-monitoring, and self-evaluating, 2) having high motivation in terms of self-efficacy, self-attributions, and intrinsic task interest, and 3) showing positive behaviour as they select, structure, and create environments that optimize their learning. During the metacognitive process, the students involve in the series of self-regulated activities which help them to focus their attention toward the ways to optimize their learning. Self-regulated learners also have good control over their motivation as they have good perception toward themselves, know how to deal with problems, and intrinsically motivated in doing many things. And the last, self-regulated learners are the learners who know what they want as well as what they need in order to make themselves learn as they find a good place to read or do their tasks comfortably. In other words, self-regulated learners are those who have good learning strategies, good motivation, and good behaviour as well.

The students with these characters might be able to involve in an ongoing learning process either in academic or in non academic life as they are able to focus their attention in achieving something, show persistence as they face the challenges they have, and know themselves well. In addition, they tend to be positive in almost anything they do as it is reflected in the productive behaviour they produce. Therefore, it is important that learning process help the students to develop this character as this will help the students to learn better and be a better person in the future.

2.2. Proces of Metacognition

Metacogntion process is one of the important aspects in self-regulated learning. According to Newell (1990) in Hatie (2009:188), metacognition is related with high level of thinking process involving active control over thinking in learning ." specifically, Brown (1980, 1987) in Brunning (2009: 81) divided metacognition into two dimension: knowledge of cognition and regulation Secara lebih rinci, Brown (1980, 1987) dalam Bruning (2009: 81) membagi metakognisi ke dalam dua dimensi, yaitu: pengetahuan tentang kognisi dan regulasi of cognition. Knowledge of cognition is divided into three components: knowledge of declarative, procedures, and conditional (Brown, 1987; Jacobs & Paris, 1987) in Bruning (2009:81).

Declarative knowledge is related with someone's ability in identifying the factors which influence his or her ability. In this case, his or her academic achievement. The nest one is knowledge of procedures. This component is related with the cognition strategy. An adult usually has basic skill in some strategies for reading, such as taking note, read slowly when they find important information, doing speed reading for the unimportant information, doing visualisation, summarizing main ideas, and doing an independent test periodically. The last one is related with when and why people have to use certain strategy.

The second dimension is related with the regulation of cognition which include three components, such as planning, regulating, and evaluating (Jacobs & Paris, 1987; Kluwe, 1987 in Bruning, 2009:82). Planning coverrs activities in choosing the appropriate strategies and allocate the resources. Sometimes, planning involves activities related with determining the objectives, reminding the past, and calculating the time required. In the nest step, regulating component requires activities related with monitoring and skills for doing an independent evaluation to control the process of their learning process. This activities also involve activities, such as predicting, atau stopping while reading, determining the specific objective, and chosing the appropriate strategies. The last component is evaluation which

refers to product evaluating process and learrning regulating process. Related activities with this component is reviewing the objectives, revising the prediction, and consolidating the intelectual achievement.

2.3. The Role of Self-regulated learning in Improving Academic Achievement

Among the variables which is predicted as the predictors of academic achievement, self-regulated learning is one of the variables which plays a significant role in someone's success. The research done by Kosnin (2007) showed that there is significant correlation between self-regulated learning and academic achievement of the 460 students of the engineering faculty of University of Technology Malaysia. In addition, Pintrich dan De Groot (1990) also showed that self-efficacy and intrinsic value are correlated with someone's performance. The regression analysis showed that self-regulation, self-efficacy, dan test anxiety are the best predictors of someone's performance.

The results of research done by Haller et al (1998) in Hattie (2009:189) showed that there is signifikan influence of learrning strategies and reading ability where metacognitive strategy is the most effective in relation to the awareness of texts inconsistencies and the use of self-questionning. In relation to that, the results of researches done by Hattie et al (1996) and Rosenshine (1996) in Bruning (2009:85) showed that the use of learning strategies systematicaly is more successful than the unorganized use of it.

Based on those previous related studies, it can be concluded that self-regulated learning is very important factor as a predictor of successful academic achievement. This research focuses on identifying the correlation between self-regulated learning and academic achievement of chemistry education study program of FKIP Unsri. Self-regulated learning is the ability in controling all learning variables. This research will operationalize the definition of self-regulated learning into seven dimensions, they are: 1) ability to receive relevan information,

(2) ability to evaluate information and compare it with the existing regulation, (3) ability to change, (4) ability to find other option, (5) ability to formulate the planning, (6) ability to implement the planning, and (7) ability to evaluate the effectiveness of the planning.

3. Method

This research applied correlational method. The sample of this study was the 76 chemistry education students out of 234 students of the whole population. The sample was chosen randomly. The data were gathered by using questionnaire of self-regulated learning and documentation of students' GPA. The questionnaire of self- learning consists of 63 items before the try out resulting 25 items left as the valid items after the try out. The reliability was checked by using cronbachs alpha method. The instrument was considered reliable as the cronbachs alpha coefficient (.545) was higher than the r-table (0.227) at the significant value of 0.05. The normality test using Kosmolgorov smirnov test was also conducted to check the normality of the data. The normality test result showed that the Z score was 0.662 with the significant value of 0.773. Since the significant value was higher than 0.05, the data was considered normal.

To find the students' self-regulated learning ability, the data from the questionnaire was analyzed and classified into 5 categories ranging from very low to very high level of self-regulated learning ability. The students' GPA was also classfied into 3 categories ranging from low to very high achievement. The data from the questionnaire were also analyzed by using Pearson Product Moment method in order to see the correlation between the students' self-regulated learning and their GPA as well as to see the correlation between each aspect of self-regulated learning and the GPA.

4. Results and Discussion

The data from the questionnare showed that the students' score of self-regulated learning range from 76 to 105; 69 students (90.7%) had high level of self-regulated learning and 7 students (9.2%) had very high level of self-regulated learning. In other words, most of the students were in high category of self-regulated learning. The description of the students' self-regulated learning score can be seen in the following table.

Table 1

Description of Students' Self-regulated Learning

Scale	Category	Total	Percentage
0—25	Very low	0	0
26—50	Low	0	0
51—75	Mediocre	0	0
76—100	High	69	90.7
101—125	Very high	7	9.2

For the GPA, the students score ranged from 2.70 to 3.68. They were distributed into 3 categories; low achievement (2.63%), mediocre (89.4%), and high (7.89%). In other words, most of the students were in the mediocre level as described in the following table.

Table 2

The Description of Students's GPA

Scale	Category	Total	Percentage
< 2.75	Low	2	2.63
2.76—3.5	Mediocre	68	89.4
3.51—4.00	High	6	7.89

Pearson Product Moment statistical analysis was applied to find the correlation between students' self-regulated learning and their GPA. The results showed that the correlation coefficient between self-regulated learning -0.13 with the significant value of .910. The significant value was higher than .000, the correlation was not significant. The correlation analysis was also done to see the correlation between each aspects of self-regulated learning and the students' GPA. The results showed that among the 7 aspects, only one aspect--SRL7 (measuring the effectiveness) correlated significantly with the students' GPA. The results of the correlation between each aspects of self-regulated learning and GPA also reveal some important information that among the 7 aspects, 5 aspects (SLR1, SRL3, SRL4, SRL5, and SRL7) correlated significantly to the total score of self-regulated learning as a whole. The description of the correlational results can be seen in the following table.

Table 3.

The Statistical Analysis on the Correlation between self-regulated learning and GPA

		GPA	**SRLtot**	**SRL 1**	**SRL 2**	**SRL 3**	**SRL 4**	**SRL 5**	**SRL 6**	**SRL 7**
GPA	Pearson Correlation	1	-0.13	-.216	.085	-.041	-.011	.046	-.091	.271*
	Sig. (2-tailed)		.910	.061	.467	.727	.924	.691	.423	.018
	N	76	76	76	76	76	76	76	76	76
SRLtot	Pearson Correlation	-0.13	1	.469**	-.198	.583**	.631**	.499**	.189	.557**
	Sig. (2-tailed)	.910		.000	.087	.000	.000	.000	.103	.000
	N	76		76	76	76	76	76	76	76
	Mean	3.23	93.105	9.9	15.3	14.76	16.6	18	3.39	16
	SD	0.22	5.45	1.1	1.73	1.9	1.63	1.58	0.75	1.5

*Correlation is significant at the 0.005 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

SRL1 Accepting relevant information
SRL2 Evaluating information and comparing with the norms
SRL3 Initiating changes
SRL4 Finding other alternatives
SRL5 Making plan
SRL6 Implementing the plan
SRL7 Measuring the effectiveness

Based on the findings, we can see that most chemistry education students of FKIP Unsri had high level of self-regulated learning and were at mediocre level of academic achievement. The result of the statistical analysis revealed that there was a negative correlation between self-regulated learning and GPA of the chemistry education students of FKIP Unsri but the correlation was not significant. The significant correlation only existed between one aspect of self-regulated learning (SRL7) and the students' GPA. In addition, 5 out of 7 aspects of self-regulated learning showed significant correlation with self-regulated learning as a whole.

Based on those findings, some interpretations can be drawn. First, although the correlation was not significant, the result still give us some important information regarding the role of self-regulated learning in students' learning. Based on the data, we can see that most of the students had high level of self-regulated learning, however their academic achievement was just at the mediocre level. In other words, their bility in self-regulating themselves in learning did not give a lot contribution on their learning achievement. The results of the analysis on each aspects of self-regulated learning showed that among the 7 aspects only one aspect which is correlated significantly with GPA. In addition, the findings also revealed that there were 2 aspects (SRL2 and SRL6) which were not significantly correlated with self-regulated as a whole. One of the 2 aspects is related with the ability to implement the plan (SRL6). Based on the findings, the mean score for this aspect is the lowest among all aspects. In other words, we can say that students are not really good at putting their thought into action or they are very

weak in implementation. Implementation is very important as it shows the reality of a plan. Unfortunately, it is not easy to execute a plan as it needs a lot of effort, courage, and high committment. Therefore, students still need to improve their self-regulated learning ability in order to help them learn and achieve better.

5. Conclusion and Remark

Based on the findings, it was found that most of the students had high level of self-regulated learning but mediocre level of academic achievement. Despite of the importance of self-regulated learning in academic achievement, the result of this study showed that there was negative correlation between self-regulated learning and academic achievement. However, the correlation was not significant. The correlation analysis was also conducted between each aspect of self-regulated learning and academic achievement. There was only one aspect (SRL7) which was significantly correlated with students' academic achievement. However, other 5 aspects (SLR1, SRL3, SRL4, SRL5, and SRL7) of self-regulated learning also showed significant correlation with self-regulated learning as a whole. This implied that students might oftenly do and apply those 5 aspects self-regulated learning in their learning activities. However, they still need to improve their ability in doing self-regulated learning as they are still very weak in implementing their plan (SLR6 is not significantly correlated with self-regulated learning as a whole).

Regarding the importance of self-regulated learning in supporting someone's success in learning, it is very important for teachers to encourage the developement of self-regulated learning of their students. Therefore, it is expected that teachers provide some activities during the teaching and learning process which can encourage the students to apply the aspects of self-regulated learning in their learning activities.

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