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The Effectiveness of Collaborative Academic Online Based Learning through Students' Self-Regulated Learning

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Abstract

Nowdays, learning through e-learning is going rapidly, including the application BeSmart UNY. This application is providing collaborative method in teaching and learning. The aim of this study was to determine the effectiveness of the Collaborative Academic Online Based Learning method in teaching and learning toward students' Self-Regulated Learning (SRL) on Vocational School Chemistry courses. This study was quasi-experimental research method with one group pre-test post-test design. Instruments used in this study were lesson plan and questionnaire of students' SRL. This questionnaire is filled by students through BeSmart UNY. In determining the differences SRL before and after teaching and learning processes, the data was analysed by statistical method. The results showed that the implementation of the Collaborative Academic Online Based Learning method in teaching and learning was effective for improving students' SRL.

Keywords: *collaborative academic online based learning, self-regulated learning*

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Introduction

Vocational School Chemistry is one of the compulsory subjects for students of chemistry education in the Yogyakarta State University. This subject has a load of 2 credits. The purpose of this course is to equip students with knowledge about curriculum in vocational school and exploring chemistry concepts in vocational school.

One method that can be performed on the Vocational School Chemistry teaching and learning is the collaborative method. The characteristic of this method is the existence of working in a group with different members, helping each other to solve a problem together, and produce a product (Palloff, 2005). Study conducted by Brindley and Walti (2009), Chao (2010) and Jahng (2012) shows that collaborative learning is possible in online and the results are quite satisfactory.

Online process in teaching and learning offers a better chance to create a social networking environment through the interaction between students and lecture. The design of online teaching and learning can be set to increase the activity of the group rather than individual activities (Brindley and Walti, 2009: 2). In the online teaching and learning involving small groups, it will be able to improve students' critical thinking skills, self-assessment, as well as reconstructing the appropriate knowledge of cooperative learning in a conventional classroom. BeSmart UNY, an application of online teaching and learning, used to support the implementation of the Collaborative Academic Online Based Learning in the Vocational School Chemistry course.

Self-Regulated Learning (SRL) is a matter that is owned by each learner who acts as the strategy adopted each learners in learning activities. Education experts agree that SRL is an important factor in the academic motivation and academic achievement. (Zumbrunn, et al, 2011: 3).

Zimmerman in Greene et al (2011: 107) states that SRL is a form of the attitude of a student to monitor and control aspects of cognition, motivation, habits, and emotions in accordance with the environment or situation changing in the learning process. Students apply SRL means that students plan, monitor and assess learning independently (Zumbrunn, et al, 2011: 3). Turan (2010: 279) states that students who have academic value (learning outcomes) higher will likely have a higher SRL and vice versa. The study conducted by Erfan Priyambodo and Sulistyani (2014) showed that there is a positive correlation when applying Multimedia Based Learning toward students' SRL.

Collaborative Academic Online Based Learning is a working group of students to solve problems through online activity. Hopefully, this method can improve students' SRL in teaching and learning.

Methods

This research was conducted at Mei-Oktober, 2015 in Department of Chemistry Education, Yogyakarta State University. This research was categorized quasy experiment with. One group pretest-posttest design. In this study, subjects were given a questionnaire about SRL before and after the learning processes. The subjects of this study were chemistry education students of class I who take Vocational School Chemistry courses, as many as 23 students.

The aspects of SRL were adapted from SRL's components stated by Zimmerman (1989: 329) which consists of (1) metacognitive, (2) motivation, and (3) behaviour. Grating instruments can be seen in Table 1.

Table 1. Grating Instruments of SRL Questionnaire

Number	SRL aspects	Count of Statements
1.	Motivation	11
2.	Behavior	8
3.	Metacognitive	9
Total Number		28

The type SRL questionnaire used is a closed questionnaire. The total amount of statements is 28 items, which are consisting of positive statements and negative statements. This questionnaire was used to measure each student SRL before and after Vocational School Chemistry teaching and learning. The option in the questionnaire answers available with a choice of five answer, which are Always (SL), often (S), sometimes (K), rare (J), and Never (TP). The scale used is Likert scale with scores from 1 to 5. On the positive statements, Always (SL) answer has the highest score (5) and so on. However, on

a negative statement, the Always (SL) answer has the lowest score (1) and so on. The example of statements in the SRL questionnaire was shown in Figure 1.



Figure 1. The Example of Statement in the SRL Questionnaire

The data of SRL was analysed by paired sample t-test. This analysis is the analysis involves two measurements on the same subject to any influence or specific treatment. This test is used to compare the average of a sample pairs (paired). Paired-samples are a sample group with the same subject but have two different treatments or measurements.

This test is performed to determine the difference students' SLR before and after participating in the teaching and learning by applying Collaborative Academic Online Based Learning method. This test is a parametric statistical analysis. It is necessary prerequisite of analysis, namely homogeneity test and normality test. All analyses using SPSS computer program. Furthermore, to determine the extent of the students' SRL, it was continued with gain score analysis.

Result and Discussion

The study on the effectiveness of Collaborative Academic Online Based Learning method toward students' SRL was using e-learning facilities owned UNY, namely BeSmart UNY. The display and descriptions of this course is shown in Figure 2.

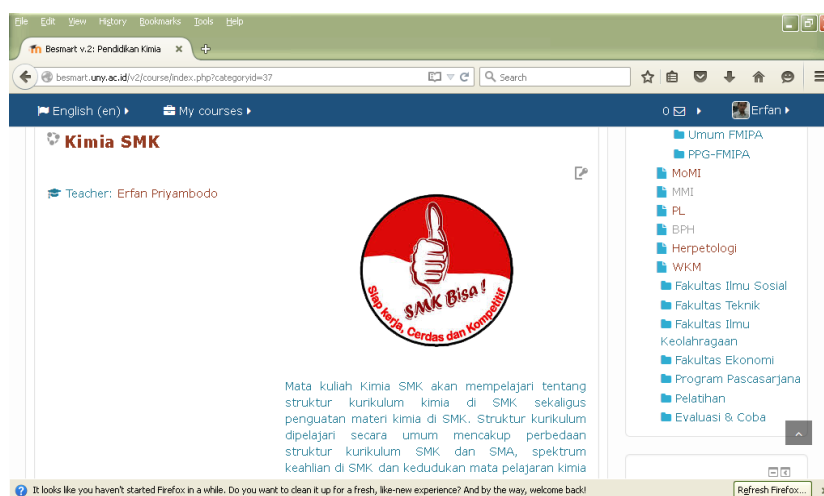


Figure 2. The Display of Vocational School Chemistry in BeSmart UNY

Vocational School Chemistry course is compulsory for students of Chemistry Education. This course is taken in the 7th semester. The burden of this course is 2 credits. The focus of this course is on the structure of the curriculum in vocational school and strengthening chemistry concepts in vocational school, especially chemistry as subjects C1 (Fundamentals of Expertise). This study focuses on three materials, which are (1) volumetric analysis, (2) gravimetric analysis and (3) petroleum.

There were 25 students registered in this course. However, 2 students were left of this course. List of participants of this course shown in Figure 3.

Select	User picture	First name / Surname	Email address	City/town	Country	Last access to course
<input type="checkbox"/>		Erfan Priyambodo	erfan@uny.ac.id	Yogyakarta	Indonesia	now
<input type="checkbox"/>		Giyas Idayu	12[redacted]@student.uny.ac.id	Yogyakarta	Indonesia	5 da 2 hour
<input type="checkbox"/>		marita dean	12[redacted]@student.uny.ac.id	Yogyakarta	Indonesia	5 da 3 hour

Figure 3. List of Participants of Vocational School Chemistry Course

Through online course, students are trying hard to discipline themselves, particularly in terms of collecting the answer of tasks of this course. Collaborative group discussion (online) is applied as the main activity of this course. After their discussion, they send the results of their discussion through BeSmart. Lecturer was provided grade and also feedback on the group discussion. The summary of the results of the data of SRL questionnaire is presented in Figure 6.

Diskusi Kelompok

Analisis kimia dapat dilakukan dengan 2 cara, yaitu analisis secara tradisional dan analisis secara modern. Analisis tradisional dapat dilakukan dengan metode gravimetri maupun volumetri. Sedangkan analisis modern dengan teknik instrumentasi. Seiring dengan berkembang pesatnya teknik analisis secara instrumentasi, masih perlukah keberadaan analisis secara tradisional? Jelaskan berdasarkan hasil diskusi kelompok Anda!

Visible groups: All participants

Grading summary

Groups	6
Submitted	6
Due date	Tuesday, 6 October 2015, 12:00 am
Time remaining	Assignment is due

Figure 4. A Group Problem in Vocational School Chemistry Course

Based on the chart above, it is clear that students have a tendency to lower the SRL decreased, while students who have a high SRL increased. This phenomena is in line with one study by Erfan Priyambodo and Sulistiyani (2014) with the results is the students have SRL higher if they used computers for teaching and learning rather than print-based materials for teaching and learning.

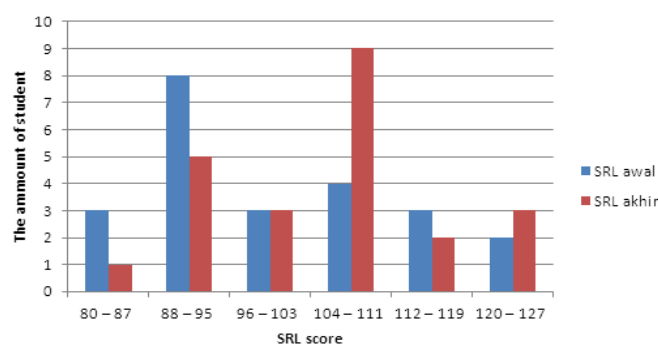


Figure 6. Frequency Distribution of SRL Data

The paired sample t-test is used to determine whether there is a difference SRL student before and after the teaching and learning using the Collaborative Academic Online Based Learning method. Table 2 shows a summary of the results of paired sample t-test. Based on the analysis shown in Table 2, it can be seen the value of “p” at the 95% confidence level is 0.010. It can be concluded that the value “p” < α (0.05) which indicates the null hypothesis is rejected and alpha hypothesis is accepted, meaning that there are significant differences SRL students before and after the teaching and learning using the Collaborative Academic Online Based Learning method.

Table 2. The summary of Paired Sample t-test

Data	SRL score	
	pre	post
Mean	99.74	104.30
Standard Deviation	12.088	10.550
correlation		0.770
p (correlation)		0.000
df		22
p (SRLearly-SRLend)		0.010

Gain score analysis conducted to determine the extent to which students SRL increase after the implementation of the Collaborative Academic Online Based Learning method. Mathematical equations to calculate the value of the gain scores (Hake, 1999) is as follows:

$$\text{Normalized gain score (g)} = \frac{\text{SRL post} - \text{SRL pre}}{\text{maximum score of SRL} - \text{SRL pre}}$$

Based on normalized gain score analysis, the mean gain score of students' SRL is 0.11. It shows that students' SRL was increase after the implementation of the Collaborative Academic Online Based Learning method. The category of the increasing students' SRL is low category. The score gain analysis also supports data analysis paired t-test and prove that the increasing of SRL is true.

According to Zimmerman (1989: 329), SRL have a role in shaping attitudes that affect students' learning outcomes, students who have a high SRL tend to have high learning outcomes. Another study by Savoji et al (2013: 1164) also states that there is a positive relationship between SRL (cognitive, metacognitive) with student learning outcomes. Similar studies have also been done to look at the relationship with the learning outcomes SRL largely positive results.

Abidin et al (2011: 143) states that the learning outcomes are influenced by many things, one of which is a style of learning (learning styles). This learning style is one of the students do SRL, is a strategy adopted each student in learning activities. Therefore, with the increase in SRL student after attending the teaching and learning using Collaborative Academic Online Based Learning method, it is expected learning outcomes of students also increased.

Conclusions

Based on this study, it can be concluded that the implementation of Collaborative Academic Online Based Learning methods in Vocational School Chemistry course is very effective for improving students' SRL.

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