The Effect of Treffingger Learning Model combined Lottery Card Method to Self Regulation

Fandi Ahmad* and Dewi Satria Ahmar

1STKIP Pembangunan Indonesia Makassar, Indonesia
2STKIP Yapti Jeneponto, Indonesia
fandi.chem@gmail.com

Abstract. Self regulation is an important component of an individual’s personality. The success of an individual in his life is ideally more influenced by emotional aspects, one of which can be seen from self regulation. Therefore self-regulation should be developed through the learning process. One of the learning models that can be used to develop self regulation is the treffingger learning model combined with the lottery card method. This research is an experimental study with the design of pretest-posttest control group desaign. The study population was a fourth semester student of Biology Education study program with a total of 95 people. Sampling was done by class random technique and two classes were selected with a total of 63 people. Research instruments and data collection techniques use self-regulation questionnaires. Hypothesis testing using independent-sample T test. The results showed that there was an effect of the Treffinger learning model combined with the lottery card method on self regulation. Students taught using the Treffinger learning model combined with the lottery card method experience high self-regulation changes.

1. Introduction
Albert Bandura in social learning theory states that humans are able to think and regulate their own behavior so that they are not merely influenced by the environment but humans and the environment can influence each other. This ability is called self regulation [1]. Self-regulation relates to one's ability to manage their own achievements and actions, determine targets for themselves, evaluate their successes when achieving these targets, and reward themselves for achieving these goals [2].

Self regulation is a key element that plays a role in the success of an individual [3]. About 80% of a person’s success is influenced by non IQ factors called emotional intelligence which one aspect is self regulation [4]. Self regulation also influences someone in acting [5]. Through self regulation a person can adapt and adjust himself in a broad situation and environment [6]. The number of cases of irregularities committed by adolescents is their inability to regulate themselves in controlling environmental influences [7]. As an effort to develop self-regulation, self-regulation is important to be developed through schools. Self regulation is not a genetic factor so it can be developed in learning. Self-regulation development in learning can be done through independent learning. Independent learning can help students be able to adapt and seek help to achieve cognitive and social maturity [8].

One learning model that can improve self-regulation is treffingger learning model [9]. Treffinger learning model is a learning model that seeks communicative learning processes so as to make the
learning atmosphere enjoyable. Students are not only required to learn material and teaching materials but also help foster students' motivation [10]. Characteristics of the Treffingger learning model are (1) assuming that creativity is a process and learning outcomes, (2) involves gradually convergent and divergent thinking skills, (3) implemented to all students in various backgrounds and levels of ability, (4) integrating cognitive and affective dimensions in its development, (5) have a systematic development stage with various methods and techniques for each that is applied flexibly [11]. The steps of the Treffingger learning model consist of three stages: (1) basic tools, The basic tools consist of divergent thinking skills and creative techniques. These skills and techniques can develop fluency and flexibility of thinking and willingness to express creative thinking to others, (2) practice with process, students are given the opportunity to apply the skills learned at the basic tools level in practical situations. At this level students are required to be actively involved in the concept learning activities carried out by showing the representation of the concept, (3) working real with problems, students apply the skills learned at the basic level of tools and practices with processes to real-world challenges. Students not only learn creative thinking skills, but also how to use this information in their lives [12].

Based on the characteristics and steps in the Treffingger learning model, it appears that the Treffingger learning model is a learning model that trains students to think creatively by giving divergent questions to them. In order for this learning model to be effective, this learning model can be combined with the lottery card method. Through the Lottery card method each student will have the same opportunity to give the answer. Students whose selected cards must provide answers. Thus, students will have the same opportunity and must always be available to provide answers.

2. Research methodology

2.1. Types and Design of Research
This research is an experimental study with a pretest posttest control group design research design.

2.2. Population and Sample
The study population was all fourth semester students of the Biology Education Program STKIP PI Makassar consisting of 95 people. The research sample was selected using class techniques and two classes were chosen. Class A is an experimental class consisting of 34 people and class B is a control class consisting of 29 people. So the number of samples is 63 people.

2.3. Research instruments
The research instrument uses a self-regulation scale developed by Miller and Brown in 1998 [13]. The test-retest reliability for the total SRQ is $r = 0.94$, $p <.0001$). Internal consistency of the scale $\alpha = 0.91$. This instrument consists of 63 items that describe self-regulation steps, namely receiving, evaluating, triggering, searching, formulating, implementing, and assessing. All 63 items are answered on a 5-point Likert scale with the following scale points from 1 (Strongly disagree) to 5 (strongly agree).

2.4. Data Analysis
Data analysis techniques used normality test, homogeneity test, and hypothesis test (independent sample T-test) based on normalized gain index. According to Meltzer [14], to measure the effect of a learning based on an increase from pretest to posttest, the normalized gain index is used.

3. Result and Discussion
The study was started by giving pretest to both sample classes. Pretest is done to determine the ability of the sample before being given treatment. Based on the results of the pretest, it was obtained the data that the pretest values of the two classes that became the study sample tended to be the same. After being given a pretest, then the two classes are given treatment. Class A which is an experimental class is given the treatment in the form of applying the treffingger learning model combined with lottery
card method and class B which is a control class given the treatment in the form of the application of conventional learning models. To see the effect of the learning model applied to both classes, posttest was conducted. The results of the posttest score showed that the experimental class obtained a higher value than the control class. The increase in value changes from pretest to posttest can also be seen from the gain value. The greater the gain value the greater the changes that occur after the treatment is given. Descriptive statistical analysis results of the pretest, posttest and gain of student self-regulation can be seen in Table 1. Student self-regulation values can be grouped based on self-regulation category namely low, medium, and high. This value can be seen in Table 2.

### Table 1 Results of Descriptive Statistics of Student Self-Regulations

| Descriptive Statistics | Pretest | Posttest | Gain |
|------------------------|---------|---------|------|
|                        | Experiments | Control | Experiments | Control | Experiments | Control |
| N                      | 34       | 29      | 34       | 29      | 34          | 29      |
| Mean                   | 180      | 182.10  | 223.53   | 209.28  | 0.3322      | 0.2086  |
| Standard Deviation     | 23.434   | 18.41   | 25.865   | 20.320  | 0.07864     | 0.06556 |
| Minimum                | 132      | 137     | 169      | 159     | 0.20        | 0.02    |
| Maximum                | 217      | 209     | 264      | 239     | 0.48        | 0.36    |

### Table 2 Table of Self Regulation Criteria

| Category | Value                                      | Experiments | Control |
|----------|--------------------------------------------|-------------|---------|
|          | Frequency | Percentage | Frequency | Percentage |
| Low      | < (x - SD) or < 192.60                      | 3           | 8.82    | 5         | 17.24     |
| Medium   | x - SD - x + SD or 192.60 - 241,34         | 21          | 61.76   | 24        | 82.76     |
| High     | > x + SD or > 241,34                        | 10          | 29.41   | 0         | 0         |
| Sum      |                                          | 34          | 100     | 29        | 100       |

Frequency distribution based on the category of increasing learning outcomes from pretest to posttest through the analysis of normalized gain index can be seen in Table 3.

### Table 3 Increased Frequency Distribution based on Normalized Gain Index

| Index Gain | Category | Experiments | Control |
|------------|----------|-------------|---------|
|            | Frequency | Percentage (%) | Frequency | Percentage (%) |
| g > 0.7    | High     | 0           | 0       | 0           | 0         |
| 0.3 < g < 0.7 | Medium  | 21          | 61.77  | 1          | 3.45      |
| g < 0.3    | Low      | 13          | 38.23  | 28         | 96.55     |
| Amount     |          | 34          | 100    | 29         | 100       |

Hypothesis test results through independent sample T-test showed that α = 0.000 <0.05 so that there was an effect of the treffinger learning model combined with the lottery card on student self-regulation.

The results of testing the hypothesis about the influence of the Treffinger learning model combined with the lottery card method on student self-regulation shows that the hypothesis is accepted. It can be
concluded that there is influence of the Treffingger learning model combined with the lottery card method on student self-regulation. This result can be used as a reference for educators to apply the Treffingger learning model model combined with the lottery card method to improve students’ self-regulation.

The application of treffingger learning model using lottery card method is a learning model that trains students to be creative in providing answers based on questions given by the lecturer. Learning nuances that require every student whose name is listed on the lottery card requires students to always learn and practice in achieving the expected learning goals. With these conditions, students will gradually become accustomed and trained to achieve their learning goals so that the results will have an effect on their regulatory abilities.

4. Conclusion

Based on the result and discussion, we can conclude that there was an effect of the treffingger learning model combine with lottery card method on self regulation learning. student thought using the treffingger learning model combined with the lottery card method experience high self regulation changes.

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