Improving Students' Learning Motivation on Graph Theory Course Through Snow Ball Throwing Method

1st Lukmanul Akhsani
Universitas Muhammadiyah Purwokerto
luk_akh@yahoo.com

2nd Anton Jaelani
Universitas Muhammadiyah Purwokerto
antonaljaelani@gmail.com

Abstract-- **This study aimed to improve students' learning motivation through Snow Ball Throwing on Graph Theory. The mean of students' learning motivation showed 3.54 in good criteria. The score of students' learning motivation then increased to 3.57 in good category. The conclusion of this study was the students' learning motivation on Graph Theory improved through Snow Ball Throwing. The results showed that the learning activities improved in each cycle in which the students showed their enthusiasm and became more active in the learning process.**

Key words: motivation, Snow ball Throwing, Graph.

I.   INTRODUCTION

Many issues could be found in our daily lives, yet not all of those could be categorized as a problem. According to Ruseffendi (1991), somethingcould be said as a problem if it is new to someone and it is in accordance with the condition of solving the problem (the stage of mental development), moreover it requires prerequisite insight. University students face difficulties in solving mathematical questions that relate to their daily lives. They complain and need long time to do the questions.

One of the applied courses which is very identical to the application of Mathematics in the daily life is Graph Theory. In this course, the students are given problems solved by mathematics science. The students of Mathematics education are the candidate teachers. As the applicationof Mathematics is not frequently taught at schools, this makes the students show low motivation to study Mathematics in advanced. This could be seen from the large number of students who are not ready in the learning process and mention that the materials are too difficult. In addition, most of students do not bring literatures. These conditions show that the students have low motivation in learning Mathematics.

The problems mentioned above could be overcome by the selection of innovative learning methods. One of those is *Snow Ball Throwing* which is significantly affect to improve students' learning motivation by raising the students' cheerfulness and enthusiasm in learning process.

The activities in the learning process also motivate the students in solving the given problems. Rasyid and Sumiati (2011) stated that Snow Ball Throwing was able to improve students' learning activities, 81,88% students were able to answer the problems as the mentioned indicators and79,34% students involved in group discussion and making questions. The improvement was expected to increase students' learning motivation on Graph Theory.

In line with the statement of Rasyid and Sumiati, Palupi (2014) in her research results mentioned thatSnow Ball Throwinglearning had a significant effect on students' learning motivation and teachers' activities both individually and grouply. Through Snow Ball Throwing, both teachers' and students' activities in the learning process showed an increase. The increase of good activities was expected to raise students' learning motivation. As mentioned above, this study aims to improve students' learning motivation through Snow Ball Throwing method semester VII at Study Program of Mathematics Education Universitas Muhammadiyah Purwokerto.

II.   THEORETICAL REVIEW

Snow Ball Throwing **Learning Method**

Komalasari (2011) stated in her book *"Pembelajaran Kontekstual Konsep dan Aplikasi",*Snowball throwing is a learning method which digs the students' leadership potential in group and students' skill of making and answering questions through imaginative game of making and throwing snow ball. Based on the experts' opinions above, it can be concluded that snowball throwing model has characteristics as follow.

a. Group work.
b. Making a question in a paper and rolling the paper in ball shape.
c. Throwingthe rolling paper to other students.
d. Answering the questions.

The procedures of Snowball Throwing learning model according toSuprijono (2009) are described as follow.

a. Teacher delivers the materials.
b. Teacher divides the students into some groups and asks the leader of groups to give explanation about the material.
c. Each leader explains the material given by the teacher to friends in his/her group.
d. Each student is given a piece of paper to write a question relating to the material.
e. Then the paper forms into ball shape and it is thrown to other students for 15 minutes.
f. After each student gets the ball/question, the student is asked to answer the question in turns.
g. Evaluation.
h. Closing.

Learning Motivation

According to Dalyono (2009) "Motivation is a booster or stimulation to do a work." This means that a work which is done with high motivation will give strong support. Thus the job can be done enthusiasticly, in strong desire or passion. Furthermore, Hamzah (2009) mentions that "Motivation is a self-stimulation to do good improvement in personal nedd fulfillment." Moreover he stated that motivation is strength both from internal and external aspects that support someone to achieve a goal.

There are some indicators of learning motivation mentioned by oleh Hamzah (2009), those are: 1). Having desire and passion to succeed. 2). Having support and needs to learn3). Having hope and ambition 4). Having appreciation to learn 5). Having interesting activities in learning process 6). Having condusive environment to study well.

III. RESEARCH METHODOLOGY

This was a classroom action research. It was conducted in two cycles with two meetings of each cycle. This study was conducted in Mathematics Education Study Program of Universitas Muhammadiyah Purwokerto. The methods of data collection were through observation to collect the data of lecturer and students' activities in the learning process, and questionnaire to know the data of students' learning motivation. The research procedures in ecah cycle were described as follow.

1. Planning
   This covers the planning of learning material, exercises, discussion of exercises, task, test questions, observation sheets, the questionnaire of learning motivation.
2. Action / Activity, includes:
   a. Lecturer divides the students into some groups.
   b. Each group makes a question in a piece of paper and it is rolled as ball shape.
   c. Throwingthe paper of ball shape to other students.

d. The group which gets the paper from other group answers the question written in the paper.
3. Observation is done to know lecturer and students' activities in learning process.
Reflection is needed to discuss about the cycles done in order to make conclusion or result of the study.

IV. RESULTS AND DISCUSSION

The first cycle was conducted by making learning plan of two learning processes. The learning activity is suited to Snow Ball Throwing learning method. The first meeting discussed about the tree of expression and the second one was spanning tree. The results of observation showed that the students did not follow the learning process well, they were hesitant in making various questions. The students made the questions based on the examples provided by the lecturer. This condition caused the process of making question taking long time as they discussed about the amswer keys. However, the success key of Snow Ball Throwing learning was the process of making questions and answers which is very challenging to the students. The question was made into snow ball and thrown to other students for a certain time.

The activity of making questions which was challenging and creative made the students became enthusiastic in doing the task. Moreover, the students were easuer to understand the material, yet they met difficulties in making expression of *prefix*or*postfix*into*infix*or in vise versa. The reflection of next cycle was the students were given the guidance about making simple questions and they did not need to provide the answer keys as that would be discussed in learning process. How Graph Theory was applied in the daily life problems became the topic of learning.

In the second meeting, the students showed more fluent and faster in making the questions. Yet, the problem in this cycle was when the students opened the paper of question directly; if the question was difficult they would throw it yet if it was easy they would keep it. This must be notified by the lecturer. Furthermore, the students' learning motivation improved and they became more enthusiastic. They made questions as good as they could and they did the questions as easy as possible. This was like snow war in which each students was eager to be the winner, here the winner was challenged to do the question from the other student. The mean of students' learning motivation was 3.54 in good criteria. This result did not show a significant effect as the previous result was 3.53.

The second cycle ran smoother compared to the first one. The students had understood the activities done in Snow Ball Throwing learning. To anticipate the long time of making question, the lecturer made the heterogen group. The question was made by the groups and thrown to the other group. In the first meeting of second cycle, the students faced difficulty of learning decision tree. Many students tried to make riddle questions and made to interesting learning and became more enthusiastic. The

students showed more enthusiastic in solving the questions, yet there were still groups modified the riddle questions faced difficulties in finding the solution of questions. However the students understood the concept of Graph better both its advantages and disadvantages application when they solved the questions. The activities of second cycle made the students became more ready and well prepared for the last meeting in which they felt easier to create the questions. The similar materials which were trace tree and expression tree made the students enjoyed the learning process. The mean of students learning motivation showed an increase which was 3.57

Based on the results above, Snow Ball Throwing learning was effective to improve learning activity in the class. As it was stated by Rasyid and Sumiati (2011) in their research that Snow Ball Throwing was able to increase students' learning activities. In the first cycle, the students motivation showed in good criteria and it showed an increase in good criteria yet it was not significant in the second cycle.This showed that Snow Ball Throwingwas able to improve students' motivation and it needed to be examined further about other influential aspects. Furthermore, based on the observation results of lecturer and students' activities in examining the application of Graph Theory. This was student centered learning in which the students created, examined, solved, and concluded the problems by themwelves. In here, the lecturer played a role as facilitator. Thus the indicators of learning motivation could occur in the learning process through *Snow Ball* Throwing method. This learning method was effective for the class which needed creativity in learning in order to improve students' motivation.

V. CONCLUSIONS

The conclusion of this study mentions that *Snowball Throwing* method is able to improve students' learning motivation on Graph Theory. Here are some suggestions based on the results of this study:
1. It needs regularity in the process of making quesions and discussion, thus the lecturer is demanded to give clear guidance in the learning process in order to create students' cheerfulness.
2. It needs good time management as the process of doing the questions written in the snow ball paper spends long time.

References

Branca, N.A .1980. Problem Solving as a Goal, Process and Basic Skill. Dalam Krulik,S dan Reys,R.E (ed). *Problem Solving in School Mathematics*. NCTM: Reston. Virginia

Gagné,R.M, Briggs, L.J dan Wager, W.W. 1992. *Principles of Instructional Design* (4nd ed).Orlando: Holt, Rinehart and Winstone, Inc.

Hamzah, B.U.2009.Teori Motivasi dan Pengukurannya. Cetakan II. Jakarta : Bumi Aksara.

Komalasari. 2011. *Pembelajaran Kontekstual, Konsep dan Aplikasi.* Bandung: Refika Aditama.

Palupi, Retno, dan Sri Anita dan Budiyono. 2014. Hubungan Antara Motivasi Belajar dan Persepsi Siswa Terhadap Kinerja Guru dalam Mengelola Kegiatan Belajar dengan Hasil Belajar IPA Siswa Kelas VIII di SMPN 1 Pacitan. *Jurnal Teknologi Pendidikan dan Pembelajaran*. Vol.2, No.2, hal 157-170, Edisi April 2014.

Rasyid, M & Sumiati S. 2011.Pengaruh Penerapan Pembelajaran *Snowball Throwing* terhadap Hasil Belajar Siswa Kelas X SMAN I Bajeng Kab. Gowa. *Jurnal Chemica*. Vol. 12 Nomor 2 Desember 2011, 69 -76.

Ruseffendi, E.T. 1991. *Pengantar Kepada Membantu Guru Mengembangkan Kompetensinya dalam Pengajaran Matematika untuk Meningkatkan CBSA*. Bandung: Tarsito.

Silberman, Melvin L. 2007. *Active Learning* (diterjemahkan Sarjuli.dkk). Yogyakarta: Pustaka Insan Madani.

Sumarmo,U. 1994. Suatu Alternatif Pengajaran untuk MeningkatkanPemecahan Masalah Matematika pada Guru dan Siswa SMA. Laporan Hasil Penelitian FPMIPA IKIP Bandung.

Suprijono, A. 2009. Cooperative Learning. Yogyakarta: Pustaka Belajar.