

# *Implementation of Reading-Concept Map-Group Investigation (Remap-GI) Model in Biology Learning to Improve X Grade Students' Learning Outcomes and Soft Skills*

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**Abstract.** Implementations of Reading-Concept Map-Group Investigation (Remap-GI) Model in Biology Learning to Improve X Grade Students' Learning Outcomes and Soft Skills.

The purpose of the research was to improve students' cognitive competence and soft skills through implementing Reading-Concept Map-Group Investigation (ReMap-GI) learning model. There are three soft skills investigated in this research, which are critical thinking, communication and cooperation. It was a participant classroom action research. It was done in two cycles. Each cycle consisted of planning, action, observation, and reflection stages. Subject of the research was 34 students, consisted of 19 female and 15 male. Instruments used were students' test, students' soft skills observation sheets, and field notes at the end of each cycle. The research findings show that implementation of ReMap-GI learning model can improve students' cognitive competence and soft skills. Percentage of students' classical achievement in cognitive competence improves time by time. In pre-cycle, the percentage is 40.63% (low), in cycle I is 67.65% (good) and in cycle II is 85.29% (very good). Meanwhile, percentage of students' soft skills also improves. In pre-cycle, the percentage is 45.31% (enough), in cycle I is 70.58% (good) and in cycle II is 82.35% (very good). From the finding, it proves that the implementation of ReMap-GI learning model can improve students' cognitive competence and soft skills in class X-2 SMAN 2 Plus Panyabungan.

**Keywords:** Action Research, Remap-GI Model, Cognitive Learning Outcome, Soft Skills.

## I. INTRODUCTION

Nowadays, education is in knowledge age with tremendous acceleration of knowledge. It is supported by digital media and technology implementation in education, called as Information super highway (Gates, 1996 in Murti, 2013). Education in 21<sup>st</sup> century provides students to be intelligent, have good characters and able to socialize with their environment. Education Minister of Indonesia, Muhadjir Efendy, states in his speech of National Teachers' Day Ceremony on November 25<sup>th</sup>, 2018 that education in 21<sup>st</sup> century should produce students who have 4C skills (Critical thinking and problem solving, Communication, Collaboration, Creativity and Innovation).

Teacher is an important element in education. According to Triana (2008 in Nursamsu and Kusnafizal, 2017), "teacher is seen as an influential person to students'

behaviors". It means that teacher's competence determines good or bad students' behavior. A professional teacher should realize that students' learning spirit and desire are not only determined by the students themselves, but also by the teacher who plays a role as a motivator. Related to this, a teacher is required to use various strategies in learning process, so that the strategies can serve students' individual differences, activate students' closeness to teacher, and encourage new skill development in order to make students have great learning motivation (Simbolon, 2017).

The 2013 Curriculum learning is competency learning by affirming learning process and authentic assessment. Beside that, learning process in the 2013 Curriculum for all levels is done by using scientific approach. Objective of learning by using scientific approach includes the development of cognitive, affective and psychomotor

competences which are elaborated for every education units. Characteristics of learning by using scientific approach are it is a student-centered learning; it involves science process skills in constructing learning concepts, laws, or principles; it involves potential cognitive processes in stimulating intellectual development, especially students' high level thinking skill; and it develops students' characters (Hosnan, 2014, in Pendrice, Suryawati, E., & Suwondo, 2018).

Cooperative learning is one of constructive learning strategies. According to Holubec (2001 in Nurhadi et al., 2004:60), cooperative learning is a learning strategy which requires students cooperation in small groups in order to maximize learning situation to achieve learning objectives. Furthermore, learning through cooperative strategy is also expected to increase students' soft skills.

Problem found in learning process is teacher' method in teaching Biology is not various. S/he only uses lecturing method. Lufri (2010: 32) states that lecturing method has some weaknesses, which are it makes students passive in learning process, it is boring for students if it is used for long time, it makes students depend much on teacher, and it makes students' learning outcome less maximal. In addition, students' soft skills, like critical thinking, communication and cooperation do not develop well. It can be seen from students' craziness in asking or answering questions in group discussion or presentation. There are only some students actively involved. Most of them do not pay attention to the discussion.

Another problem found is students' reading interest is still low. It is known from short interview done on Wednesday, September 5<sup>th</sup>, 2018 to Indonesian teachers in SMAN 2 Plus Panyabungan, who are Salamah Nasution, S.Pd and LiaWinni Novelia, S.Pd, as persons responsible for school literacy program evaluation. The interview revealed that students' interest in reading books is only at the time of examination. Beside that, classroom literacy program, which should be done 15 minutes before starting learning process, does not run well.

Inappropriate learning method and low of students' reading interest are hypothesized to be the main causes of the low of students' cognitive learning outcome.

**Based on the background of problem above, problems in this research were identified as follows:**

1. No variation of learning method.
2. Students are less motivated and active in learning process.

3. Students' reading interest is still low.
4. Students' cognitive learning outcome is still low (under KKM)
5. It is important for students to have soft skills.

Problem limitation in a research is an effort to limit or focus the research into one or some problems so that its indicators of success can be measured. To make the research more focus, it was limited only on students' cognitive learning outcome and soft skills.

Based on the limitation of the problem above, the formulation of the problem in the research was as follow: What is the effect of Reading-Concept Map-Group Investigation (Remap-GI) learning model on X grade students' cognitive learning outcomes and soft skills in Biology learning material of Plants in SMAN 2 Plus Panyabungan academic year 2018/2019?

The purposes of the research were to know:

1. The effect of Reading-Concept Map-Group Investigation (Remap-GI) learning model on X grade students' cognitive learning outcomes in Biology learning material of Plants in SMAN 2 PlusPanyabungan academic year 2018/2019.
2. The effect of Reading-Concept Map-Group Investigation(Remap-GI) learning model on X grade soft skills in Biology learning material of Plants in SMAN 2 PlusPanyabungan academic year 2018/2019.

## **II. RESEARCH METHOD**

It was a classroom action research (CAR). According to Darmansah (2009, in Harahap, 2018), CAR is a research which aims at improving learning process and outcomes qualities through a treatment in form of cycles based on teacher's observation towards problems in classroom in order to give the best solution for students in learning process. It was a participant CAR because the researcher was directly involved from the beginning of the research until the making of the report.

The research was done in SMAN 2 PlusPanyabungan. The subject was 34 students in class X-2 SMAN 2 PlusPanyabungan in academic year 2018/2019.

The implementation of this research consisted of two cycles. Each cycle consists of Planning stage, Action stage, Observation stage and Reflection stage. It is based on the procedure of classroom action research implementation proposed by Kemmis and McTanggart.

Data and source of data in this research came from researcher, students and observer. Data in this research include:

1. Data of students' cognitive competence

Data of students' cognitive competence were obtained from tests administered in the end of each cycle. Before tests were used as the research instrument, it was done a pilot test to them. The pilot test was administered to determine validity, item discrimination, item difficulty and reliability by using ANATES software.

Students are mastery if their score is  $\geq 75$ . Percentage of classical learning mastery can be calculated by using the following formula:

$$NT = \frac{ST}{N} \times 100$$

Description:

NT = Classical learning mastery

ST = Number of students who reach KKM

SM = Number of students in classroom

(Sudjiono, 2004)

Classical learning mastery is categorized based on Arikunto's (2012: 245) opinion, as in Table 1 below.

Table 1. Criteria of Classical Learning Mastery

| Students' Scores | Category   |
|------------------|------------|
| 80-100           | Very Good  |
| 66-79            | Good       |
| 56-65            | Enough     |
| 40-55            | Not Enough |
| 30-39            | Failed     |

Source: Arikunto, 2012: 245

2. Data of Students' Soft Skills

In this research, students' soft skills are focused on critical thinking, communication and cooperation soft skills during learning process. Sources of the students' soft skills data are:

a. Observation Sheets of Students' Soft Skills

Data of students' soft skills obtained from observation sheets were analyzed by using formula proposed by Sudjiono, as follow:

$$X\% = \frac{SS}{STS} \times 100$$

Description:

X = Percentage of students' soft skills

SS = Score of students' soft skills

STS = Maximum score of students' soft skills

Indicators of students' soft skills classical mastery can be seen in Table 2 below.

Table 2. Interval of Students' Soft Skills

| Score Interval | Category  |
|----------------|-----------|
| 81-100         | Very good |
| 61-80          | Good      |
| 41-60          | Enough    |
| 1-40           | Bad       |

(Sudijono, 2004)

b. Field Notes

It is important source of data used in this research because it is written form of what was heard, seen, observed and thought during the research in classroom. Beside that, it was used as qualitative data to explain what happened in the research.

c. Documentations/Photos

It was used to obtain data from the research object before and after treatment.

### III. FINDINGS AND DISCUSSION

#### A. FINDINGS

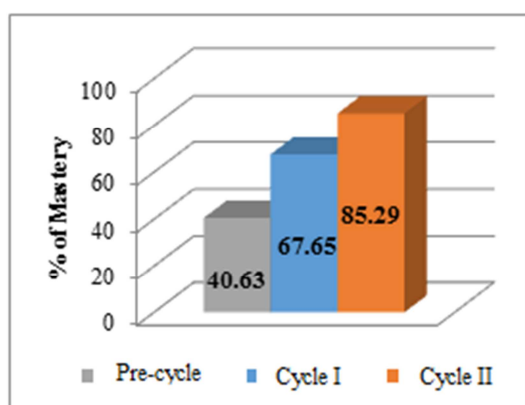
1. Result of Students' Cognitive Competence

From the result of the test, it is known that students' average score improves because of using Reading-Concept map-Group Investigation (Remap-GI) learning model in learning material of Plants. The improvement is shown by the increasing of students' learning mastery percentage in learning process started from Pre-cycle, Cycle I and Cycle II, as seen in Table 3 and Graphic 1 below.

Table 3. Comparison of Students' Cognitive Learning Outcomes

| Cycles | Average score | Number of Students who reach KKM | Percentage (%) |
|--------|---------------|----------------------------------|----------------|
| Pre-   | 68.78         | 13                               | 40.63          |
| I      | 80.82         | 23                               | 67.65          |
| II     | 84.41         | 29                               | 85.29          |

From Table 3 above, it can be seen that students' average score in pre-cycle is 68.78, in which students who reach KKM are 13 students and the ones who do not reach KKM are 21 students. In Cycle I, students' average score improves to 80.82, in which students who reach KKM are 23 students and the ones who do not reach KKM are 11 students. In Cycle II, students' average score is 84.41, in which there are 29 students who reach KKM and 5 students who do not reach KKM. Percentage of classical mastery of learning in pre-cycle is 40.63%, which includes in "Not Enough" category. In Cycle I, it increases to 67.65%, which includes in "Good" category. In Cycle II, it increases to 85.29%, which includes in "Very Good" category.



Graphic 1. Improvement of Students' Cognitive Learning Outcomes

## 2. Result of Students' Soft Skills Observation

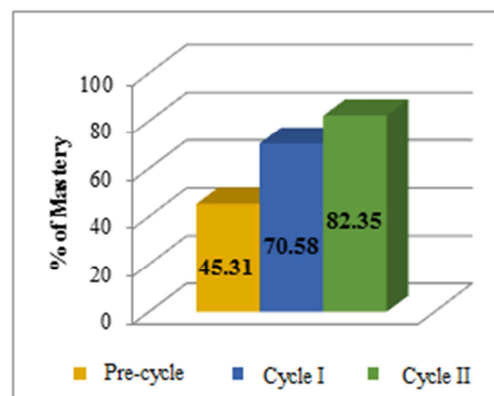
Result of students' soft skills observation in pre-cycle is 45.31%, which includes in "enough" category. In Cycle I, it improves to 70.58%, which includes in "good" category. In Cycle II, it improves to 82.35%, which includes in "very good" category. The improvement of students' soft skills in every cycle can be seen in Table 4 and Graphic 2 below.

Table 4. Comparison of Students' Soft Skills

| Cycle | Percentage of Soft Skills (%) |
|-------|-------------------------------|
| Pre-  | 45.31                         |
| I     | 70.58                         |
| II    | 82.35                         |

From Table 4 above, it is obvious that there is improvement of students' softskills from pre-cycle 45.31%

to 70.58% in Cycle I (increasing 25.27%), and it improves to 82.35% in Cycle II (increasing 11.77%).

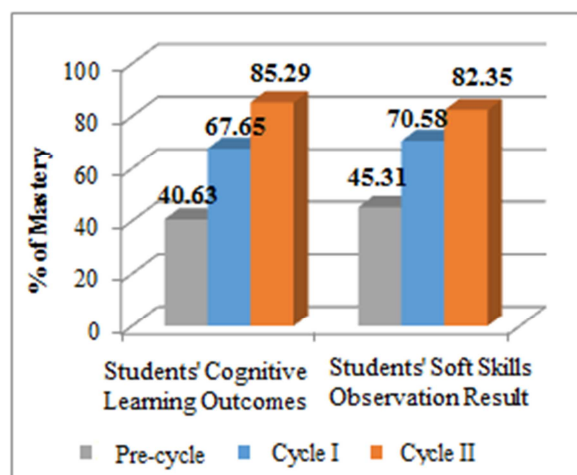


Graphic 2. Result of Student' Soft skills

Overall, the research findings can be seen in Table 5 and Graphic 3 below.

Table 5. Overall Findings of Research

| No | Aspects                                         | Cycles |        |        |
|----|-------------------------------------------------|--------|--------|--------|
|    |                                                 | Pre-   | I      | II     |
| 1. | Result of Students' cognitive learning outcomes | 40.63% | 67.65% | 85.29% |
|    | Result of students' soft skills observation     | 45.31% | 70.58% | 82.35% |



Graphic 3. Overall Result of the Research

From Table 5 and Graphic 3 above, it is obvious that there is improvement of students' cognitive learning outcomes and softskills after applying Reading Concept Map Group Investigation (Remap-GI) learning model.

## B. DISCUSSION

### 1. Result of Students' Cognitive Learning Outcome

Cognitive learning outcomes are the outcomes of acquiring knowledge activities or processes through self-experiences. Cognitive is oriented on thinking skill or intellectual skill, such as a skill which requires students to combine previously learned procedures to solve a problem (Yamin, 2006 in Setyoko and Indriaty, 2018).

The improvement of cognitive competence is caused by the increasing of students' understanding by doing various observation activities and collecting data during learning process. It is in line with Dirman and Juarsih (2014, in Pedrice, et al., 2018) who assert that basically, the development of students' cognitive competence is an effort to increase observation aspect, recall, think, create and students' creativities. To create good thinking and recalling, it needs to implement a learning model which can improve students' competence (Pedrice, et al., 2018).

In addition, the improvement of students' learning outcome is influenced by learning approach factor, which is strategy or method used in learning process (Slameto, 2010: 65). Implementation of Reading-Concept Map-Group Investigation (ReMap-GI) learning model can improve students' cognitive learning outcomes. It is obvious from students' test result which improves from Pre-cycle to Cycle I to Cycle II.

The ReMap-GI learning model has some advantages, which are 1) students are provided with additional knowledge acquired from reading tasks and conceptual framework making, which become the foundation of this learning model and 2) students also get experiences in using this as one of cooperative learning models in learning process.

Reading is an activity which can improve students' knowledge. If students have more knowledge, they will be better to identify and choose necessary information in arranging conceptual framework. Skill in processing and analyzing the obtained information to solve a problem is one of critical thinking skills (Duron, et al., 2006; Fascione, 2013). Moreover, Kridaklaksana (in Andriani, 2001:19) asserts that reading is defined as: 1) exploring information from a passage in form of texts, images, diagrams, graphics, tables, or combination of those; 2) a skill to identify and understand the written language in form of graphic symbols sequence and its changes into a meaningful discourse in form of silent understanding or loud instruction.

An indicator which shows a reader understands what s/he reads is s/he can retell contents of the text. It is in line with Razak (2007:11), who states that reading comprehension is reader's ability to retell the content of argumentative, expository or descriptive texts about a certain topic.

Cognitive domain is a domain which includes mental (brain) activities. According to Bloom (1956: 28), all efforts related to brain activity is in cognitive domain. It is related to thinking skills, such as remembering, understanding, applying, analyzing, synthesizing, and evaluating. It is known as Bloom's Taxonomy. In addition, Anderson and Krathwohl (2002: 214) did a fundamental revision to what have ever been developed by Bloom. It is known as Revised Bloom's Taxonomy. According to Anderson and Krathwohl (2002:215), cognitive process level based on Revised Bloom's Taxonomy is hierarchical, which means that categories in cognitive process level are arranged based on its complexity. the Revised Bloom's Taxonomy levels are remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), creating (C6).

In this research, the test which is used to measure students' cognitive learning outcomes consists of LOTS (Low Ordinary Thinking Skills) questions and HOTS (High Ordinary Thinking Skills) questions. Maksum (2012: 2) states that cognitive levels of applying (C3), analyzing (C4),

evaluating (C5) and creating (C6) are high level cognitive aspect measured from students' thinking skill.

The research finding shows that students' cognitive learning outcome improves because of the use of ReMap-GI model in learning process. it is proven by students' average score in Pre-cycle is 68.78; then, it improves to 80.82 in Cycle I; next, it improves to 84.41 in Cycle II.

In Table 6, it is obvious that number of students present in Pre-cycle was 32 students. Students PS and RH were not present because they were sick. Classical learning mastery

in the pre-cycle is 40.63%, in which the number of students who reach KKM is 13 students. In Cycle I, it increases to 67.65%, in which there are 23 students who reach KKM. It also increases in Cycle II to 85.29%, in which there are 29 students who reach KKM. To make it clear, it is illustrated in Table 6 below.

Table 6. Recapitulation of Students' Cognitive Learning Outcome

| No | Students' Name | Pre-Cycle | Cycles |    | Description* |    |    |
|----|----------------|-----------|--------|----|--------------|----|----|
|    |                |           | I      | II | Pre-Cycle    | I  | II |
| 1  | AR             | 58        | 70     | 75 | TT           | TT | T  |
| 2  | AF             | 97        | 93     | 95 | T            | T  | T  |
| 3  | AA             | 76        | 77     | 88 | T            | T  | T  |
| 4  | AM             | 65        | 80     | 85 | TT           | T  | T  |
| 5  | AP             | 54        | 83     | 90 | TT           | T  | T  |
| 6  | ARZ            | 76        | 87     | 90 | T            | T  | T  |
| 7  | AP             | 77        | 93     | 93 | T            | T  | T  |
| 8  | AS             | 63        | 70     | 80 | TT           | TT | T  |
| 9  | AA             | 63        | 80     | 85 | TT           | T  | T  |
| 10 | DF             | 71        | 93     | 90 | TT           | T  | T  |
| 11 | DT             | 90        | 83     | 85 | T            | T  | T  |
| 12 | DD             | 80        | 97     | 95 | T            | T  | T  |
| 13 | FM             | 84        | 93     | 90 | T            | T  | T  |
| 14 | HA             | 67        | 77     | 80 | TT           | T  | T  |
| 15 | IK             | 78        | 73     | 80 | T            | TT | T  |
| 16 | IW             | 63        | 87     | 90 | TT           | T  | T  |
| 17 | IS             | 63        | 93     | 95 | TT           | T  | T  |
| 18 | MIK            | 48        | 77     | 90 | TT           | T  | T  |
| 19 | MLA            | 57        | 93     | 95 | TT           | T  | T  |
| 20 | MRL            | 72        | 80     | 90 | TT           | T  | T  |
| 21 | MTT            | 90        | 80     | 85 | T            | T  | T  |
| 22 | MZ             | 53        | 70     | 70 | TT           | TT | TT |
| 23 | PS             | (sick)    | 73     | 70 | -            | TT | TT |
| 24 | RH             | (sick)    | 87     | 80 | -            | T  | T  |
| 25 | RR             | 53        | 73     | 80 | TT           | TT | T  |
| 26 | RA             | 84        | 73     | 70 | T            | TT | TT |
| 27 | RN             | 46        | 60     | 75 | TT           | TT | T  |
| 28 | RA             | 56        | 80     | 83 | TT           | T  | T  |
| 29 | SDP            | 88        | 73     | 73 | T            | TT | TT |
| 30 | SU             | 19        | 60     | 65 | TT           | TT | TT |
| 31 | TA             | 73        | 87     | 88 | TT           | T  | T  |
| 32 | YS             | 97        | 87     | 90 | T            | T  | T  |

|                   |    |        |        |        |    |    |   |
|-------------------|----|--------|--------|--------|----|----|---|
| 33                | ZN | 60     | 73     | 85     | TT | TT | T |
| 34                | ZA | 80     | 93     | 95     | T  | T  | T |
| Average           |    | 68.78  | 80.82  | 84.41  |    |    |   |
| Classical Mastery |    | 40.63% | 67.65% | 85.29% |    |    |   |

Description: T = students who reach KKM (Score  $\geq 75$ )

TT = students who do not reach KKM (Score  $< 75$ )

## 2. Result of Students' Soft Skill Observation

Soft skill is a skill that should be possessed by someone in life. It is useful to have good relations to groups, society, or even God. By having soft skills, someone will be recognized as a good person in society. Communication skills, emotional skills, linguistic skills, cooperation skills, spiritual skills and having good ethics and manners are some examples of soft skills (Elfendri, et al., 2011:67). However, there are only three soft skills studied in this research. They are critical thinking, communication and cooperation.

### a. Students' Critical Thinking Soft Skills

According to Ennis (in Maftukhin, 2013: 22), critical thinking is logical and reflecting thinking which focuses to decide what should be trusted or done. In addition, Ennis (in Maftukhin, 2012: 24) also proposes that critical thinking skill has some indicators. which classified into five groups, as follows:

#### 1) Elementary Clarification

It is divided into three indicators, which are (a) identifying or formulating questions, (b) analyzing arguments, and (c) asking and answering clarification questions and/or challenging questions.

#### 2) The Basis for the Decision

it is divided into two indicators, which are (a) considering source credibility and (b) observing and considering the observation results.

#### 3) Inference

It consists of three indicators, which are (a) making a deduction and considering result of the deduction, (b) making induction and considering result of the induction, and (c) making and considering the decision value.

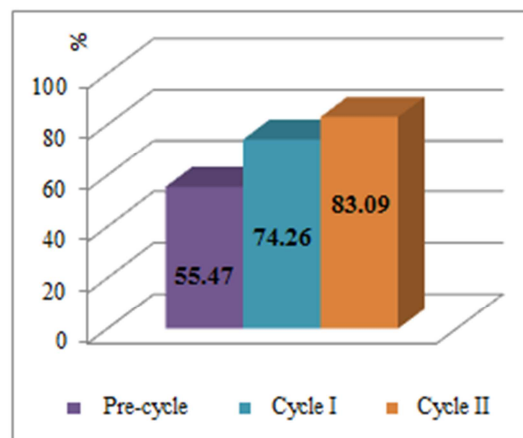
#### 4) Advanced Clarification

It is divided into two indicators, which are (a) identifying terms and considering their definitions and (b) referring to unstated assumption.

## 5) Supposition and Integration

It consists of two indicators, which are (a) considering and thinking logically about other premises, reasons, assumption, positions, and suggestions disagreed by them or make them doubt without bothering their mind, and (b) combining other skills and dispositions in making and defending a decision.

The finding of the research shows that there is an improvement of students' critical thinking soft skill, as seen in Graphic 4 below.



Graphic 4. Result of Students' Critical Thinking Soft Skill

In Graphic 4 above, it is seen that there is an improvement of students' critical thinking soft skill. Percentage of students' critical thinking soft skill in pre-cycle 55.47%; while, in Cycle I, it increases to 74.26%; and in Cycle II, it also increases to 83.09%. The findings are in line with Prihartiningsih (2017), who states that ReMap-GI learning model can improve students' critical thinking skill, scientific process and cognitive learning outcomes. Zubaidah, et al. (2014) also asserts that implementation of ReMap-GI model can improve students' critical thinking skill and Biology learning outcomes.

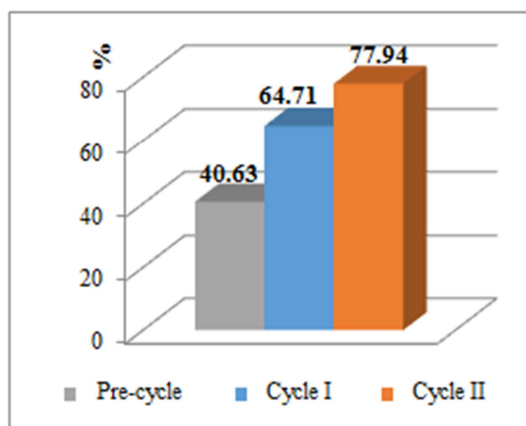
**b. Students' Communication Soft Skill**

Communication is delivering and understanding a message from a person to other (Beni, 2012: 111). Furthermore, Larry (2010: 18) states that communication is a dynamic process in which a person tries to share his internal problem to other by using symbols.

There are some communication skill indicators, which are:

- 1) Skill in answering questions
- 2) Skill in communicating ideas in symbols or tables
- 3) Skill in working together in groups

The finding of the research shows that there is an improvement of students' communication soft skill, as seen in Graphic 5 below.



Graphic 5. Result of Students' Communication Soft Skill

In Graphic 5 above, it is obvious that there is an improvement of students' communication soft skill. Percentage of students' communication soft skill in pre-cycle is 40.63%; while, in Cycle I, it increases to 64.71%; and in Cycle II, it also increases to 77.94%. The improvement is caused by the implementing of Remap-GI learning model. One of the strengths of Remap-GI model is it can train students in communicating to others. It is in line with Kurnias and Berlin (2016: 73), who state that Group Investigation model has some advantages, as follows:

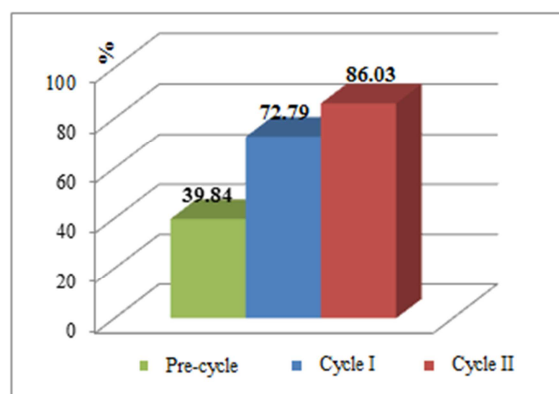
1. Group Investigation learning model has positive effect in improving students' learning outcomes.
2. Implementation of this model has positive effect in improving students' learning motivation.

3. Learning process makes students work together and interact each other in groups without seeing their background.
4. This model can train students to have good skill in communicating and sharing opinion or ideas.
5. This model also motivates and encourages students to be active from the beginning until the end of learning process.

**c. Students' Cooperation Soft Skill**

Cooperation in learning process is important. According to Johnson (2011: 164), cooperation can erase mental constrains because of limited experience and narrow perspective, so that it will enable students to find their own strengths or weaknesses, to respect others, to listen open-mindedly, and to build a consensus.

The research finding shows that there is an improvement of students' cooperation soft skill, as seen in Graphic 6 below.



Graphic 6. Result of Students' Cooperation Soft Skill

In the Graphic 6, it is seen that there is an improvement of students' cooperative skill. Percentage of students' cooperation skill in pre-cycle is 39.84%; then, it increases to 72.79% in cycle I; and it becomes 86.03% in cycle II. The improvement is caused by Remap-GI learning model is a kind of cooperative learning, in which the focus of it is social aspects, such as the creation of interactive activity among group members and mutual interest among students (Slavin, 1995).

So, based on the explanation above, the findings show that the implementation of Reading Concept Map Group Investigation can improve students' critical thinking,

communication and cooperative soft skills. It can be seen in Table 7 below.

Table 7. Finding of students' critical thinking, communication and cooperative soft skills

| Cycles | Soft Skills       |               |             |
|--------|-------------------|---------------|-------------|
|        | Critical Thinking | Communication | Cooperation |
| Pre-   | 55.47%            | 40.53 %       | 39.84 %     |
| I      | 74.26%            | 64.71 %       | 72.79 %     |
| II     | 83.09%            | 77.94 %       | 86.03 %     |

In Table 7 above, it is obvious that students' soft skills improve in all evaluated aspects.

#### IV. CONCLUSION

After conducting a classroom action research in class X-2 of SMAN 2 Plus Panyabungan, started from pre-cycle, cycle I and cycle II, result of observations and reflections can be concluded as follows:

1. There is an improvement of students' cognitive learning outcomes after implementing Reading Concept Map Group Investigation (Remap-GI) learning model. The percentage of students' mastery in pre-cycle is 40.63%; while, in Cycle I is 67.65%; and in Cycle II is 85.29%.
2. There is an improvement of students' soft skills of critical thinking, communication and cooperation after implementing Reading Concept Map Group Investigation (Remap-GI) learning model. The percentage of students' soft skills in pre-cycle is 45.31%; while in cycle I is 70.58%; and in Cycle II is 82.35%.

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