The Enhancement of Student's Communication Skills through *Remap*-NHT in Learning Biology

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Abstract: Empowering communication skills can be done through an implementation of appropriate learning models. Remap-NHT could potentially improve communication skills through syntax of reading, concept mapping, and discussion. This study aims to determine the influence of Remap-NHT on communication skills conducted in August-December 2019. Samples amounted are 100 students from three classes of XI MIPA SMA Negeri 4 Malang, each of which has been discussed with Remap-NHT, NHT, and control. Data were analysed using Oneway-Ancova which previously carried out One-Sample Kolmogorov-Smirnov test and Levene's Test of Equality of Error Variances. The results showed that Remap-NHT significantly improved communication skills compared to NHT and control.

Key Words: communication skills; *remap*-NHT

Abstrak: Pemberdayaan keterampilan komunikasi dapat dilakukan melalui penerapan model pembelajaran yang sesuai. Model pembelajaran *Remap*-NHT berpotensi meningkatkan keterampilan komunikasi melalui sintaks membaca, membuat peta konsep, dan diskusi. Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran *Remap*-NHT terhadap keterampilan komunikasi yang dilakukan pada bulan Agustus-Desember 2019. Sampel berjumlah 100 siswa dari tiga kelas XI MIPA SMA Negeri 4 Malang yang masing-masing dibelajarkan dengan *Remap*-NHT, NHT, dan kontrol. Data dianalisis menggunakan *Oneway-Ancova* yang sebelumnya dilakukan uji prasyarat *One-Sample Kolmogorov-Smirnov test* dan *Levene's Test of Equality of Error Variances*. Hasil penelitian menunjukkan bahwa *Remap*-NHT lebih signifikan meningkatkan keterampilan komunikasi dibandingkan dengan NHT dan kontrol.

Kata kunci: kemampuan komunikasi; *remap*-NHT

INTRODUCTION

Communication skills are necessary to have for a human being (Eliöz, 2016; Koc & Dundar, 2018; Kovac & Sirkovic, 2017; Sugito, Susilowati, Hartono, & Supartono, 2017). Communication skills have an important role in connecting students' knowledge (Hoon, Fadzlin, Mohamad, & Singh, 2017; Khan, Khan, Zia, & Khan, 2017). This is necessary not only to promote the field of education, but also to prepare them to compete in the field of work (Al-Musalli, 2019; Kovac & Sirkovic, 2017; Olszewski, Panorska, & Gillam, 2017).

Communication that is effective and successful does not happen only through words (Eliöz, 2016), nonverbal communication (or body language) is important as well (Okoli, 2017). The goal of communication is to send a message and to express our point of view about our experience or our perception. A speaker tries to help audiences in understanding the meaning of a message by using verbal and nonverbal communication (Okoli, 2017). Written and verbal communication skills need to be empowered in schools (Al-Musalli, 2019).

In reality, it shows that senior high school students still struggle to develop their communication skills (Al-Musalli, 2019). A research conducted in several high schools in Makassar shows that learning method used in class uses rote learning and does not support students' communication skills (Dipalaya, Susilo, & Corebima, 2016). A research from Oktaviani and Nugroho (2015) in SMA Negeri 1 Sokaraja shows that the students' communication skills are still categorized as low and it can be noticed when they are still nervous and not confident when presenting their work in class. Kovac and Sirkovic (2017) say

that written and verbal communication skills are often ignored so that many students are still incapable to do it. Communication failures are increasing every day despite many developments have been made in the field of communication (Dagal, 2017). These communication skills can be influenced by learning activities implemented in school (Khan et al., 2017). Accurate teaching activities that are implemented will contribute to the success of learning objectives (Maman & Rajab, 2016).

Learning activities that focus on group activities can increase students' communication skills. Halimah & Sukmayadi (2019) state that cooperative learning model can enhance student communication. One of the examples of cooperative learning is *Numberred Heads Together* (NHT) (Maman & Rajab, 2016). NHT helps to create a student-centred learning environment (Mustami & Safitri, 2018). Unfortunately, the NHT syntax implementation takes a long time. It needs syntax from the outside learning activities that can support the activities inside the classroom (Rosyida, Zubaidah, & Mahanal, 2016). *Remap-coople* learning method has syntax of reading and making concept map that can be done at home.

Remap-coople is a learning model that is developed by Zubaidah and Corebima (2016) which combines syntax of reading and making concept map with cooperative learning conducted at home. The combination between NHT learning model and *Remap-coople* is called *Remap*-NHT. The model has a potential to improve students' communication skills because it has an adequate syntax. A research by Dinnurriya, Zubaidah, and Mahanal (2015) shows that *Remap*-NHT can increase student's metacognitive and learning outcomes. However, the effect on communication skills has not been revealed.

Based on the explanation above, this paper is conducted to find the effect of the *Remap*-NHT on the student's communication skills. The hypothesis provided is *Remap*-NHT affects student's writing and verbal communication skills.

METHOD

The quasi research is conducted in XI MIPA (or second grade of senior high school student with the major study of natural science) SMA Negeri 4 Malang in the academic year of 2019/2020. The research design is *Nonequivalent Pretest-Posttest Control Group. Cluster sampling* design is used to determine the sample that is obtained based on the equivalence test in the form of multiple-choice questions that are given to all XI MIPA classes. The test has resulted into experimental class which is XI MIPA 5 (n=35) which is taught with *Remap*-NHT, positive control class which is XI MIPA 3 (n=35) which is taught with NHT, and negative control class which is XI MIPA 6 (n=32) which is taught with learning activities that are usually done by the teacher and it will be the control class in the research.

Learning by using *Remap*-NHT begins with students read and make concept map at home. Their concept map is presented in the class by one of the group members as the representation. After that, the activity is continued by learning using NHT cooperative that has the first syntax which is *numbering* which is giving numbers to every student in every group in the class. The next syntax is giving questions to the students (*questioning*). The next syntax is *heads together* where the students conduct a discussion together with their group members. The last syntax is *answering* where the students with a certain number answer the question from the teacher and the other group while the student with the same number gives a response, additional answer or rebuttal toward the previous question.

The instrument that is used to collect the data of the written communication skills is three questions that are arranged and analysed based on the written communication skills rubric of Alghalith (2012). The data of the verbal communication skills is collected by observation using a rubric of Greenstein (2012). Preliminary data are obtained from a pre-test which is given to the three classes. The materials that are taught are KD (Basic Competence) 3.5 and 4.5 about human movement system and the other materials are KD (Basic Competence) 3.6 and 4.6 about human circulatory system. The learning activity is conducted from October 2019 to December 2019. The final data are obtained through a post-test using the same questions. Data analysis uses *One-way Ancova* at a significance level of 5% or 0.05 where the prerequisite test is previously carried out in the form of a normality test (or *One-Sample Kolmogorov-Smirnov test*) and homogeneity test (*Levene's Test of Equality of Error Variances)* foremost.

RESULT

The result of *Anacova* analysis toward written communication skills is in the Table 1 and the result of further test of LSD/BNT is in the Table 2. In Table 1 it is known that the significance level is 0.000

Table 1. Summary of Anacova Analysis Results of Written Communication Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3493.673[a]	3	1164.558	67.207	.000	.677
Intercept	258.204	1	258.204	14.901	.000	.134
X	2949.026	1	2949.026	170.189	.000	.639
Perlakuan	299.846	2	149.923	8.652	.000	.153
Error	1663.487	96	17.328			
Total	316298.000	100				
Corrected Total	5157.160	99				
a. R Squared = ,677 (Adjusted R Squared = ,667)						

Table 2. Test Results of LSD Learning Strategies on Written Communication Skills

Learning Model	Average	Notation
Remap-NHT	57.898[a]	a
NHT	55.704[a]	b
Conventional	53.610[a]	c

Table 3. Summary of Anacova Analysis Results of Verbal Communication Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2521.498[a]	3	840.499	32.005	.000	.500
Intercept	792.083	1	792.083	30.162	.000	.239
x	1658.053	1	1658.053	63.137	.000	.397
Perlakuan	451.667	2	225.834	8.599	.000	.152
Error	2521.092	96	26.261			
Total	430277.000	100				
Corrected Total	5042.590	99				

Table 4. Test Results of LSD Learning Strategies on Verbal Communication Skills

Learning Model	Average	Notation
Remap-NHT	67.876[a]	a
NHT	65.040[a]	b
Conventional	62.558[a]	c

< 0.05 so that the research hypothesis is accepted that the implementation of *Remap*-NHT affects the written communication skills. On Table 2, it is known that the corrected average value of the argumentation skills in the implementation of *Remap*-NHT is 57.898 which is higher than the implementation of NHT which is 55.704 and control which is 53.610. This shows that the students' written communication skills who use *Remap*-NHT are highly different from those who use NHT and control.

Table 3 and 4 are the result of the Ancova analysis and further test of LSD/BNT toward students' verbal communication skills. Table 3 shows that the significance value is 0.000 < 0.05 which means the learning model affects verbal communication skills. Table 4 shows that *Remap*-NHT has corrected average which is 67.876 and this is highly different from NHT which is 65.040. Both of them is also highly different from the control which is 62.558. This shows that *Remap*-NHT is the most significant in enhancing the students' communication skills.

DISCUSSION

Communication skills are important to be empowered in schools. Enhancing students' verbal communication skills will help the students to be braver to speak and take control of what they say, more than that it can shape a good character for them (AlSaleem, 2018; Kovac & Sirkovic, 2017). Developing suitable communication skills will be the foundation for the students to mingle with their environment, build a healthy social relationship and control their emotional reaction (Dagal, 2017).

According to this research, it can be shown that the students' written and verbal communication skills are increasing when they learn using a different learning model. It is seen from the significance value of both skills which is $0.00 < 0.05$. *Remap*-NHT can increase the students' communication skills significantly compared to the learning model of NHT and control which are based on the further test of LSD/BNT. Traditional learning is not significant either in enhancing the students' communication skills (Ashokan & Venugopal, 2016). Effective communication skills are not general personality traits that are naturally acquired from the home environment; otherwise, communication skills are personalities that require training and practice in a suitable context to assist an individual builds communication competence (Al-Musalli, 2019).

Students' written communication is measured by using essay questions which are developed based on the written communication rubric of Alghalith (2012). Below is the example of the students' written communication skills on the question about human movement system. The example is from three students from three classes that are taught by using different learning models. Student A is from *Remap*-NHT class, student B is from NHT class, and student C is from control class.

Student A: The hard and flexible structure is caused by vitamin K in the bones. When bones are immersed in HCl, K ion will react with HCl ion. Hence, over time the HCl ion will shed the K ion so that the bones become flexible and pale in colour.

Student B: Due to the nature of hydrochloric acid which can dissolve calcium in the bones so that if they are soaked, they will lose its calcium.

Student C: Because HCl can dissolve the calcium in the bones so that the bones become pale and flexible.

According to the statements above, it is seen that student A is more coherent in composing the sentences, the expressions are easy to understand, and the contents are relevant to the question given. Student B composes the sentences with the content that is in-depth but the sentences arrangement is not proper and tends to be difficult to understand. The sentence structure of student C is not coherent, it is showed by the student immediately answers with the word 'because' at the beginning of the sentence and the content is not in-depth enough. The learning model of *Remap*-NHT has a syntax that supports the development of the students' written and verbal communication skills which is reading, making concept map and group or class discussion through cooperative learning NHT. Reading activity is conducted at home (Zubaidah & Corebima, 2016) so that the students already have the knowledge before doing the learning activities at school. The reading activity has the correlation toward communication skills (Al-Musalli, 2019). It also increases the students' communication skills. This is in line with the research from Khan (2017) who says that communication skills involve reading activity.

The next syntax is making concept map. This activity is done at home (Zubaidah & Corebima, 2016). Concept map is often used in pedagogy as a tool to represent knowledge in learning (Mahanal, Zubaidah, Bahri, & Dinnurriya, 2016). Concept map created by the students is more like a mind map (Figure 1a) by putting the general concept in the middle and there are branches in each part. Figure 1b shows student's work that is like a concept map with a summary of
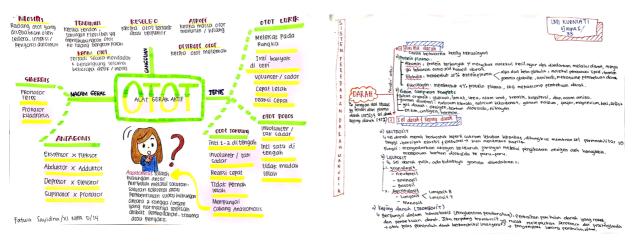

Figure 1. Student's works; a) Movement system, b) Circulatory system

the explanations for each of the conceptual braches. In the arrangement of the concept map, a general part should be placed on top and a more special part at the bottom (Zubaidah & Corebima, 2016).

The last syntax from the learning model of *Remap*-NHT is group and class discussion. The discussion is started by giving a question (*questioning*) from the teacher to one of the students who has a certain number and then it is continued by providing a response from the student with the same number but from another group. The syntax is important to enhance communication skills. A discussion with other students can increase communication skills (Ahmetoglu & Acar, 2016; Koc & Dundar, 2018). Group activities more significantly improve communication skills compared to individual activity (Eliöz, 2016; Halimah & Sukmayadi, 2019; Olszewski et al., 2017). Communication is a form of exchanging information through an interaction between one person to another (Halimah & Sukmayadi, 2019). There is a significant relationship between listening activities and communication skills (Koc & Dundar, 2018).

The score of the students' written and verbal communication skills are increasing after the implementation of cooperative learning NHT and *Remap*-NHT, however, the learning model of *Remap*-NHT is the most significant in enhancing the students' communication skills. This result is achieved because it is supported by the syntax that this learning model has. The reading stage has a big connection with communication skills. This can be seen from the communication skills rubrics of Greenstein (2012) and Alghalith (2012) which make reading one of the indicators in assessing students' communication skills. Making concept map by the students makes learning more meaningful and the quality of communication depends on the level of understanding reached. The combination of *Remap* and cooperative learning of NHT is also one of the supporting factors of the students' communication skills because in its implementation, it needs students to be more active, the interaction between students and teachers can train their communication skills.

CONCLUSION

From this research, it can be concluded that the learning model affects the students' written and verbal communication skills. The learning model of *Remap*-NHT is the most effective to enhance the stu-

dents' written and verbal communication skills compared to the learning model of NHT and control.

The study population is limited which only involves three classes in a school. Hence, further research can be conducted by involving a larger population. This research is also limited to the variable of communication skills so that further research can be about the effect of *Remap*-NHT on the other 21st Century skills.

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