Effect of Collaboration the STAD with Audio Visual Media on IPA Knowledge Competencies of VII Class SMP Negeri 32 Padang

N Azizah, Lufri
Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang, Padang, West Sumatra, 25173, Indonesia

*lufri_unp@yahoo.com

Abstract. Based on the problems found in SMP Negeri 32 Padang that the low competence of students’ knowledge because students being less active in the learning process and finding it difficult to learn IPA. So, solution for the problem is group learning models. The group learning models that can be used is the STAD. STAD can also be collaboration with audio-visual media to make students active and enthusiastic so that they can improve their learning outcomes. The research type is a quasi-experimental research with a population of VII class students of SMP Negeri 32 Padang who were registered in 2018/2019. Sample (experimental class and control class) are taken using purposive sampling technique. The research instrument is test (multiple choice) and data will be analyzed with T-test. The result from this research is knowledge competency of experimental is higher than the control class (80.53 > 73.40) and make H1 accepted because sig.< 0.05 . So, the conclusion is collaboration the STAD model’s with audio visual media have significant effect on IPA knowledge competency of VII Class SMP Negeri 32 Padang.

1. Introduction
Creating qualified human resources is the main goal of education. Currently, humans prioritize education as something that must be achieved in order to develop their potential. In accordance with RI Law no. 20 of 2003 concerning the National Education System Chapter 1 Article 1 explains that education is a conscious and planned effort to create an atmosphere of learning and the learning process so that students actively develop their potential, society, nation and state [1]. Trianto [2] states that the function of National Education is based on Pancasila and the 1945 Constitution of the Republic of Indonesia, namely to develop capabilities and form a dignified national character and civilization in order to educate the nation's life [2]. The form of the educational function is implemented in the application of the Education Curriculum.

Currently the ongoing education curriculum in Indonesia is the 2013 curriculum. According to the Ministry of Education and Culture (2013) the 2013 curriculum is a learner-centered learning effort, making active learning and from its own learning pattern into group (team-based) learners. The implementation of the 2013 curriculum aims to improve the quality of education in Indonesia. However, after researchers made observations at school, students were not active in the learning process.
Based on the results of observations made by researchers at SMP Negeri 32 Padang, researchers found that the school has implemented the 2013 Curriculum since 2017. However, for science subjects, the 2013 Curriculum is applied at the beginning of the 2018 semester. Then it relates to the science learning process in class. Researchers found that the teacher has applied learning with a scientific approach, using the lecture method, discussion method and image media.

As for the problems during learning, there are still students who are not focused. This is in accordance with the results of a questionnaire given to students, namely 66% of students are often sleepy while studying and 84% of students often scribble during learning, thus making them not focus when learning takes place. Then 70% of students find it difficult to learn science material.

Other information obtained in the field is that there are still many students who get daily test scores below the Minimum Completeness Criteria (KKM) value of 75. This can be seen from the average daily test scores for VII class SMP Negeri 32 Padang in the 2018/2019 academic year. as stated in Table 1.

### Table 1. Average value of daily tests of VII class Classification of Living Creatures material in science subject at SMP Negeri 32 Padang in the academic year 2018/2019

| No | Class | Mean |
|----|-------|------|
| 1  | VII 3 | 66.7 |
| 2  | VII 4 | 67.7 |
| 3  | VII 5 | 67.8 |

Based on the problems faced by students above, it is necessary to make efforts to overcome them, namely by optimizing the application of active learning models. Lumpkin et al. [3] explained that active learning is very effective in attracting the attention of students in the teaching and learning process because it can change the condition of passive learning to be active [3]. Furthermore, the results of research by Lufri et al. [4] regarding active learning show that the application of active learning can have a positive effect on knowledge competencies, attitudes and skills [4].

One active learning that can be used as a solution to this problem is the Student Teams Achievement Divisions (STAD) type of cooperative learning model. Slavin [5] explains that the cooperative model of the Student Teams Achievement Divisions (STAD) is one of the simplest learning models and is very good for teachers to introduce active learning models. Pulungan [6] also explains that the STAD type of cooperative learning model is simpler and easier to implement. The results of other studies also explain that STAD is able to build cooperation between students, help each other, provide motivation, and trust each other, and can train students to speak such as daring to ask questions and express opinions [7, 8].

The use of audio-visual media in the form of video in learning will also attract the attention of students because they can see and listen to the content of the video so that students will more easily understand and remember lessons and will make students more interested and enthusiastic because students are asked to report what is happening. they see [9]. Therefore, this study will combine the application of the STAD cooperative learning model with the help of Audio Visual media.

Media as well as audio-visual are very suitable to be applied to science learning in schools. Science subject is a subject that finds out about nature systematically. Science is also a subject that involves a lot of student activities in learning. One of them is by involving a lot of critical thinking, practicum, solving problems from real life, and making scientific conclusions. According to him, audio-visual media will have a positive impact on the learning competence of students in the domains of knowledge, attitudes and skills, when applied in conjunction with the Student Teams Achievement Division (STAD) type of cooperative learning model in science learning [10].
2. Methodology
This type of research is experimental. The experimental research used was quasi-experimental (quasi-experimental). In this study, students were divided into 2 classes, namely the experimental class and the control class. Learning using the Student Teams Achievement Divisions (STAD) model assisted by Audio Visual media was applied to the experimental class, while in the control class there was no such treatment.

The population in this study were students of VII class SMP Negeri 32 Padang who were registered in the 2018/2019 academic year. Researchers took samples through purposive sampling technique. Samples were taken using purposive sampling technique by considering several criteria. The criterion is that the class is taught by the teacher of the same subject and has the same variance. Meanwhile, to determine the control and experimental classes, the researcher used the Randomized Posttest Only Control Design system.

Data processing using SPSS software. It is used to process data in the form of statistical figures in the form of homogeneity tests, normality tests and hypothesis testing. The research instrument used was a multiple choice written test. The test questions were analyzed first both from the content and empirically and then validated by lecturers and teachers of science subjects. The data analysis technique was performed using the T-test with SPPS programs (sig. < 0,05). T-test has two requirements, it is homogeneous data and normally distributed.

3. Results and Discussion

3.1. Description of Data
Data of students' knowledge competency obtained from the test (multiple choice) which was given to students at the final meeting of each Basic Competency (KD). Please see table 2.

| Class         | N  | Mean | Maximum | Minimum |
|---------------|----|------|---------|---------|
| Experimental  | 30 | 80.53| 97      | 45      |
| Control       | 30 | 70.43| 93      | 52      |

So, from table 2 we know that the knowledge value of the experimental class is higher than the control class.

3.2. Testing Requirements Analysis
a. Normality Test
Normal data if the value is sig. > 0.05. Please see Table 3.

| Class        | Knowledge Competency | Sig. | Description |
|--------------|----------------------|------|-------------|
| Eksperimental|                      | 0.06 | Normal      |
| Control      |                      | 0.20 | Normal      |

So, from table 3 noted that the sig. from the experiment class normality test is 0.06 > 0.05, so that the data is Normally Distributed. Then, the sig. control class is 0.20 > 0.05, so that the data is also Normally Distributed.

b. Homogeneity Test
Homogeneous data if the value is sig. > 0.05. Please see Table 4.
Table 4. Homogeneity Test Result

| Class       | Knowledge Competency | Sig. | Description |
|-------------|----------------------|------|-------------|
| Eksperimental |                      | 0.75 | Homogeneous |
| Control     |                      |      |             |

So, from table 4 noted that the data is homogeneous. Because, the result are greater than 0.05 (0.75 > 0.05).

3.3. Hypothesis Testing
Because the data is normally distributed and homogeneous, then hypothesis testing used the t test. The results of hypothesis testing please see table 5.

Table 5. Hypothesis Testing Results

| Class       | Sig. | A   | Information |
|-------------|------|-----|-------------|
| Eksperimental | 0.02 | 0.05| H₁ be accepted |
| Control     |      |     |             |

4. Discussion
The results of hypothesis testing explain that the Cooperative Learning Model Type Student Teams Achievement Divisions (STAD) collaboration with Audio Visual media have an effect on IPA knowledge competency. Because, the value of hypothesis testing is smaller than 0.05.

The mean score of the experimental class students was higher than the control class. The STAD learning model is applied by dividing groups of students heterogeneously based on ability, gender, race and ethnicity. Each group consists of 5 to 7 students. According to Eminarto et al. this type of STAD cooperative learning includes active learning which emphasizes activities and interactions between students so that they motivate each other and help each other understand learning materials to get satisfactory grades. The STAD learning model has 5 syntax (steps), namely: Class percentage, team, quiz, individual progress score and team recognition.

STAD is a learning model that can trigger students to work together in the learning process, so that they encourage and help each other in mastering the expected competencies and raise awareness that learning is important, meaningful and fun. STAD has an important role in learning, namely encouraging students to be active, innovative and creative in the learning process in the classroom.

In addition, audio-visual media (video) is also very important in the learning process. The use of video as a learning medium can have the following positive impacts:
1) Helping to understand and remember lessons, and will increase the attention of students.
2) Making students active in participating in learning.
3) Can improve student learning outcomes.

5. Conclusion
The conclusions from this research that Student Teams Achievement Divisions (STAD) models collaboration with Audio Visual media have significant effect on IPA knowledge competency of VII class SMP Negeri 32 Padang. So, Teachers can use the STAD learning model collaboration with Audio Visual media during the learning process. This is attempted to increase the IPA knowledge competency.

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References

[1] Undang-Undang RI No. 20 Tahun 2003 tentang Sistem Pendidikan Nasional

[2] Trianto. (2012). Model Pembelajaran Terpadu. Jakarta : PT Bumi Aksara

[3] Lumpkin, A., Achen, R. M., & Dodd, R. K. (2015). Student perceptions of active learning. College Student Journal, 49(1), 121-133.

[4] Lufri, L., Fitri, R., & Yogica, R. (2018). Development of Learning Models Based on Problem Solving and Meaningful Learning Standards by Expert Validity for Animal Development Course. In IOP Conference Series: Materials Science and Engineering (Vol. 335, No. 1, p. 012094). IOP Publishing.

[5] Slavin, Robert, E. (2016). Teori, Riset dan Praktek ( Diterjemahkan dari Cooperatif Learning). Bandung : Nusa Media.

[6] Pulungan, N. A. (2018). The Comparison of Student Achievement and Student Activity in Cooperatif Learning With TPS and STAD at Topic of Cell in Senior High School. Jurnal Pendidikan Biologi, 7(2).

[7] Nikmah, E. dkk. (2013). Model Pembelajaran Student Teams Achievement Divisions (STAD), Keaktifan Dan Hasil Belajar Siswa. Artikel : Universitas Negeri Malang

[8] Riyadi, Nanang dkk. (2015). Peningkatan Hasil Belajar Biologi Dengan Penerapan Model Kooperatif Tipe STAD Pada Siswa Kelas X-F SMA Negeri 1 Tangen Sragen Tahun Pelajaran 2013/2014. BIO-PEDAGOGI ISSN: 2252-6897. Volume 4, Nomor 1

[9] Roihana, R. Z., Pukan, K. K., & Irsadi, A. (2018). Usage Effectiveness of Video and Mama Card In Biology Learning of Human Reproductive System. Journal of Biology Education, 7(1), 54-63.

[10] Nurlatifah, A., & Ambarwati, S. (2017). Pengaruh Model Pembelajaran Kooperatif Tipe Student Teams Achievement Division (STAD) Terhadap Hasil Belajar IPA ditinjau dari Keaktifan Siswa. Natural: Jurnal Ilmiah Pendidikan IPA, 4(2), 48-54.

[11] Huda, Miftahul. (2011). Cooperative Learning. Yogyakarta : Pustaka Pelajar.

[12] Esminarto, dkk. (2016). Implementasi Model Stad Dalam Meningkatkan Hasil Belajar Siwa. BRILLIANT: Jurnal Riset dan Konseptual Volume 1 Nomor 1, November 2016.

[13] Ling, W. N., Bin Ghazali, M. I., & Raman, A. (2016). The effectiveness of student teams-achievement division (STAD) cooperative learning on mathematics achievement among school students in Sarikei District, Sarawak. International Journal of Advanced Research and Development, 1(3), 17-21.

[14] Brame, C. J. (2016). Effective educational videos: Principles and guidelines for maximizing student learning from video content. CBE—Life Sciences Education, 15(4), es6.

[15] Achrudin, Sajidan & Meti Indrowati. (2013). Peningkatan Aktivitas Sosial Siswa Dalam Pembelajaran Biologi Melalui Penerapan Model Pembelajaran STAD disertai Video Di Kelas VII SMP Negeri 1 Jate. Pendidikan Biologi Volume 5, Nomor 1 Halaman 96-103n