

## Scientific Learning on the Teaching with Theme Always Save the Energy

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### Abstract

The objective of this research is to analyze the observation activity, to ask, to try, to analyze, and to communicate with the theme Always Save the Energy using scientific learning approach in elementary school. This is qualitative research. The object was purposively in SDN 4 Penyangkringan Kecamatan Weleri Kabupaten Kendal. Data collection was taken by observation, interview, and documentation. Data analysis was done by data reduction, data display, and conclusion. Triangulation was done to get the data validity. The result of the research shows that the scientific approach in the Always Save the Energy theme uses observation, asking the question, and collecting information in the learning activity. The observation activity done by the student is observing pictures in books and LCD, observing video prepared by the teacher, observing the realia, and observing the teacher's explanation. The asking activity is; asking and giving answers between teachers and students after they observed and listened to the teacher's explanation. The experiment activity was in the group, to prove about the evaporation liquid by sunlight, practicing a song notation, corn planting, making windmill from used drinking bottle, telling the experiment of the use of electricity, and drawing pictures of saving the fossil oil. The analysis and communication are done by students to analyze the result of the experiment. The communication activity was done both in individuals and the group.

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## INTRODUCTION

The effort of fulfilling the future needed and preparing a productive generation, creative, innovative, and affective in 100 years of the independence of Indonesia, or in the year of 2045 called “Indonesia Emas” can be done by the education process. With education, we can build the generation that able to compete in the globalization era. Education always has to do with the learning process.

Teachers must be able to arrange activity in the teaching and learning process so that it can run based on its line. Teachers need to design scientific activity and make it suitable for the condition of each school (Kamaliyah, 2016). Teachers need to provide a contextual problem that can stimulate students to think creatively to solve it (Kiptiyah, Masrukan, & Putra, 2016). Moreover, Indriawan, *et al.* (2018) stated that the preparation of the learning plan must be in line with instruction in the school, whether it is in meeting or MGMP that has the core learning activity in students. Teacher effort in increasing students’ activity is very important because students’ activeness has become key to the teaching and learning process.

Ideally, the teaching and learning process must involve students actively. It is in line with Permendikbud No. 22 the year 2016, it says that teaching and learning process must be done interactively, inspiring, fun, challenging, and can motivate students to participate actively, and give the students enough space to the idea, creativity, and encouraging based on talent, physical and psychological students. The learning process should use a scientific approach. Kemendikbud (2013) provide concepts that the scientific approach is the learning process that adopted scientific steps in building knowledge of students through the scientific method in its execution. The scientific approach in the learning process included: observing, asking, trying, composing, displaying, concluding, and creating.

The learning-based scientific method is one of the developing of the teaching process

based on constructivism learning theory. Learning is constructing self-interpretation through a new experience, social interaction and environment (Yamin, 2013: 24). Knowledge is the result of interaction between people and the environment, which is connected with the previous experience. Learning by applying the scientific approach can increase the students’ activeness in it. This is in line with Baedhowi (2018), he stated that scientific learning can encourage students to be more active, it can stimulate them to produce ideas, and make it easy students in understanding the lesson.

According to Hosnan (2014:34), scientific approach is the process that has been arranged to encourage students actively constructing concept, idea, or principle through some steps; observing (to identify or finding problem), identify and provide hypothesis, collecting the data through various technique, analyze the data, make conclusion, communicate the concept they found. Treagust *et al.* (2013) stated that the use of the scientific model can increase students’ understanding, development of scientific ideas. A scientific approach makes students think scientifically to find the concept, to reconstruct, to internalize, and to explain or communicate to people. Students experiment with the scientific model can help students in developing the scientific mental model. Moreover, scientific approach provides an educator with a set of guidance to explore science with students. By implementing seven step of scientific method, both teacher and students are involved in activity that allow them to think about scientific concept, asking the question and participating in the process of finding the answer from their environment (Gerde *et al.*, 2013).

Scientific approach is about making students as the core of teaching and learning process so that it will increase their understanding. A scientific approach significantly influences the result of students achievement, finding something new through experiment, and the interaction between students in group, all of those will impact

students motivation in learning (Maduretno, Sarwanto & Sunarno: 2015). While Kusmaryono & Suyitno (2016) states that, it cannot only be seen in the result, but we also consider the process is also important. The use of scientific approach makes lessons are easy to understand, then it increase students achievement (Arnawa, Suardika & Ardana, 2015).

Scientific approach in learning process at school can increase students achievement cognitively or affectively and psychomotor. Machin (2014) shows that the application of scientific approach is not only has the positive impact to cognitive result, but also affective and psychomotor. Furthermore, Said *et al.* (2016) shows that cooperative based scientific approach is really give impact to students. Mahmudah (2016) explained that scientific approach is effective, it can be seen from the percentage that more than 75% students get the score higher than KKM in the knowledge competence, skill, and manner.

Scientific approach also can increase students learning motivation because students can study without any interfere, they feel free and finally they can get the high score. Sumayasa, *et al.* (2015) shows that there is an influence learning motivation between students that follow the scientific learning process and students who don't. Wibowo (2017) stated that scientific approach does not make students get bored. Students are able to construct knowledge and skill through facts they found in investigating in real life so that students learning spirit has been increased.

In contrast, this scientific approach still not understandable its concept and application. The process still run in conventional way. Some teachers nowadays tend to teach only to achieve the curriculum target, then to memorize rather than understanding, students were not trained to find knowledge, were not trained to find concept. Generally, school still use lesson plans (RPP) 2013, and this is so complex that teacher must divide students' activity into five learning process; observing, asking, collecting information, analyzing, and communicating.

The teacher has not mastered the 2013 curriculum, teacher still become center of learning process, not student. This scientific approach was only attached in lesson plan (RPP) but still teacher centered.

It is common that teaching and learning process involved observation, teacher just use textbook. In *asking* activity, most of students did not get their confidence to express their opinion. In experiment process, restricted only for lesson that ask students to make experiment. It is still teacher centered learning process, teacher become all source during the lesson. It influenced the atmosphere during the learning process become not so interesting for students.

Based on survey, there are 33 elementary school in Weleri. The researcher choose SDN 4 Penyangkringan as the object of research, it is because this school implements curriculum 2013 and the location is in sub urban, the condition is not really good, and it can be an inspiration for other school in implementing curriculum 2013.

Problems in this research is how the implementation of scientific approach in learning process. Regulation made by ministry of education and culture for implementation of curriculum 2013 still cannot be done well based on the ministry regulation No 22 Year 2016. This policy is such a motivation to make research on the application of curriculum 2013 about the standard process of scientific approach with the theme Always Save the Energy in Grade IV SDN 4 Penyangkringan. Besides, there is not research that similar with this in elementary school.

This research gives the description about the learning process using scientific approach in the theme Always Save the Energy and give the idea in order to increase the quality of learning for the teacher in applying scientific method. The aim of this research is to analyze the observation activity, to ask, to try, to analyze, and to communicate with the theme Always Save the Energy using scientific learning approach in elementary school.

## METHODS

This is qualitative research in the learning process, which is a concern in the natural condition of its object, and the researcher is the key element in this research, the researcher uses triangulation to collect the data, the analysis of the data is inductive/qualitative. The researcher uses case study as the methodology of this research, it is collecting data based on the available phenomena during the research, the researcher also conduct deep exploration toward the program, event, process, and activity of one or more people (Creswell, 2016: 19).

The location of research was decided purposively, it is in SDN 4 Penyangkringan Kecamatan Weleri Kabupaten Kendal. Focus of this research is the implementation of scientific approach in learning process with the theme Always Save the Energy in SDN 4 Penyangkringan. The subject of this research are teacher and students of grade IV, and headmaster as the supervisor.

Data collection technique are observation, interview, and documentation. Data validity are; continuous observation, and triangulation. Technique of descriptive qualitative is by using three ways; data reduction, data display, and conclusion.

## RESULTS AND DISCUSSION

Based on the general description, scientific learning approach has been implemented well. The implementation does by the teacher step by step. From the lesson plan that the researcher observed, there are three step in learning process; introduction, core activity, and closing. Those are in line with what the teacher's say:

"Before we go to the core activity, we usually have an introduction. I usually ask students to pray first, to greet, and checking student's presence, the next is singing our national anthem, and give some words to student to keep their learning spirit, and then clap the hand. I tell the students about the lesson plan on that day (W.2)."

It is also proved with the result of observation during the introduction activity, teacher started the lesson by asking a student to lead praying and greeting. Next is the teacher checked students presence by calling them one by one, after that the teacher led the students to sing the national anthem. The teacher motivated students by asking them to clap the hand. In apperception activity, the teacher started to use learning media or by giving them questions dealing with the lesson. After that the teacher delivered the lesson, and also tell them the goal of learning that part of lesson, but the teacher did not tell them about scoring method.

After the introduction was completed, they moved to the core activity. In this core activity, it is about curriculum 2013 that contain 5M activities: observing, asking, trying, associating, communicating. Those 5M may be delivered randomly based on the situation. In one time lesson, it is alright if it is not contain all those 5M. The process of scientific learning is done in the core activity. It is in line with the interview with the headmaster. The headmaster says that:

"Steps of learning by implementing scientific learning approach exist in observing, asking, trying, associating, and communicating (W.1)".

Yuniasih (2015) states that teacher are allowed to arrange the scientific learning randomly based on the students needed so that the learning process does not make students get bored. Saeroji, *et al.* (2018) states that 5M syntax can be divide into some meetings in the core activity, because every lesson in each meeting contains opening, core activity, and closing. Besides, teacher must be creative and innovative in arranging learning process, in order to make it meaningful, can encourage students to think creatively, and make students feel enjoy (Niron, 2016).

### Observing Activity

Based on the result of activity, the implementation of this method by using guidance from RPP (lesson plan). The observation activity which is done in the first

step, students observing the picture of the influence of sunlight to human being and the creature on earth that displayed on LCD. The next is, students read the text about natural resource of Indonesia. Besides, students were also observed spinach and listened the teachers' explanation about the role of sunlight to green plantation. It is in line with the interview with teacher.

"In the first activity, I showed them the picture of activity with the sunlight. Besides, to make it more interesting, I would bring a green plantation so that students will understand the role of sunlight to plant (W.2)".

The result of the second observation, students were watching the video how the read the song notation of planting the corn. Next, students listened teacher's explanation about the song. It is in line with the interview:

"For the second lesson, I gave them the song and the video containing planting corn and then I gave them example on how to sing it (W.2).

The result of observation on the third meeting, students observed the propeller brought by teacher. Students told how to make it be spin. After that, students observed video of the benefit of propeller as an electric generator. Students pay attention very carefully on the teacher. It is in line with what the teacher had said.

"In this third observation, I showed students a propeller made from paper and I played video of the turn of the energy from that propeller and its benefit (W.2)".

The result of the fourth activity, students observed the human activity using electronic equipment. They observed very carefully so that they can deliver their opinion. Another video was about how to save the energy. Students pay attention on how we should do in saving the energy. It is in line with the interview:

"In this fourth meeting, I showed them picture of the usage of electrical equipment in a house and then I showed them video of the way how to save the energy on LCD (W.2)".

The result of fifth meeting, students had been showed the song and notation of planting corn song. The teacher displayed video of

planting the corn and its notation. Besides, the teacher ask students to observe picture on the book. It is the same with the result of interview:

"In the fifth meeting, I gave them example on how to sing the song and displayed the video on how to plant the corn (W.2)"

The result on fifth meeting: students observed the picture about the use of fuel on the vehicle and read the text carefully so that they can do instructions written on the book. Students were also observed the video displayed on LCD about how the fuel energy had been formed and give the benefit to human being. Students are also listened carefully on teacher's explanation on the obligation of human being to save the energy. It is in line with the interview:

"In this sixth meeting, students looked at the picture in the book. Next is I showed them a video about fuel and read the text about it (W.2)".

Activity of observation process as show in Figure 1.



**Figure 1.** Observation Process

Based on the Figure 1 it can be seen that observation was done by looking at the video. Observation can be done by watching the video, reading, or paying attention to teacher. It is in line with interview with the headmaster:

"To do the observation activity in scientific learning can be done by listening, reading, and paying attention to tea teacher based on the lesson (W.1)".

Observation is about getting close with the object so that we can get information and facts in the form of the data objective that can be analyzed based on the grade of students (Nivianto & Mustadi, 2015). Besides, Yuniasih

(2015) stated that observation activity is done by students with their five senses.

### Asking Activity

Asking activity uses scientific learning is need to be done in order to train students to arrange question dealing with the topic or lesson. Asking activity is the next step after the observation was done. Students are allowed to ask questions about lesson they still confused. The teacher give the opportunity to students to ask, it also to stimulate students to be active in class.

The obstacle faces by teacher during the asking activity is that not all students feel confident to ask. Only few student were active in asking question or answer the question, then the rest was do not have the enough confidence in asking question. It is the same with the interview:

“I usually ask students after the observation activity. Asking is very important so that the class will not be bored and will be students’ centered. What I have done in this activity was giving opportunity to student to ask question about the lesson (W.2)”.

Activity of asking activity as show in Figure 2.



**Figure 2.** Asking activity

Through the asking activity, students were hoped to develop their knowledge about the lesson. Besides, through this activity, students can build their own lesson factually, conceptually, and procedurally as the effort to make them able to think metacognitive through discussion or group work. It is in line with the headmaster had spoken:

“In this activity, we hope that students can build their own knowledge and it will make them having a deep thinker. So that teacher must be able to push their students actively asking question. It is good for students to train them actively speaking (W.1)”.

Teacher have a big role in growing motivation to students in this activity. The teacher must give the opportunity to students to ask about they have seen, read, and watch (Ardiantari, Wiarta, & Manuaba, 2015). A good teacher will always successfully attract students to get close with him and students will not be afraid to ask question and discuss it to the teacher (Febriyanti, 2014). Like what Arnawa *et al.* (2015) had researched, the scientific approach that have been seen from the characteristic questions from the teacher can give good positive impact to the result of study.

### Trying Activity

Based on the result of observation, trying / collecting information that done by the teacher used the guidance from RPP. The activity which done on the first lesson, students did the experiment outside the class to prove the evaporation in group. They equipment were 2 handkerchief, 2 piece of tissue, and 2 piece of paper. All the things were getting wet and place it under the sun and others under a warm place. Students observed it in group for about 15, 30, and 60 minutes. It is in line with the interview:

“Students made a demonstration to prove the evaporation of liquid. The activity was done in group with the handkerchief, paper, and tissue for each two group. After that one of it was placed under the warm place and other under the sunlight directly (W.2).

The second meeting of trying activity, students were divided in group of 5. One student as a leader and give the sign. Every group performed notation of the song planting the corn. Other group must pay attention while another group performed. The other trying activity was looking at the picture inside the book. Students must answer the question and exchange it with their friend. It is similar with the result of interview:

“Trying activity in the second meeting, I asked students to sing a song of plant the corn in a group. Besides, they also finish to answer the question in book (W.2).

In the third meeting, students created windmill and waterwheel from the used bottle. The next is students did the experiment using water to watering mill using windmill. Students displayed windmill in front of the class (W.2)”.

In the fourth meeting, students were asked to answer question in pair. One students paid attention picture A and answer the question A, while others on B. After finished doing, students discussed it with their pair. After that, they turn to answer the question with the same rule. It is in line with the teacher’s said: “In this fourth meeting, I asked them to answer the question in the book and discussed it together (W.2)”.

This trying activity that is done in the fifth meeting, students were divided into group of 6 and sang the plant corn song. Other groups must paid attention and give comments. It is just like what the teacher’s said: “In the fifth meeting, students were asked to sing a song in a group (W.2)”.

In the sixth meeting, students did the examination in book. Students were also draw picture about saving the fuel. Then they exchange it with their table mate. He asked his friend to tell the picture. It is just like what the teacher’s said: “In this sixth meeting, I asked them to do task in the book. I also asked them to draw picture of saving the fuel (W.2)”

Activity of trying activity as show in Figure 3.



**Figure 3.** Trying Activity

Based on Figure 3 it can be concluded that trying/collecting information which done by students in lesson 1 enabled them to collect information from many source and experiment.

Scientific approach can be used to increase students’ ability. It is in line with Dewi & Rochintaniawati (2016), they stated that scientific approach involved students in exploring their scientific ability. Through scientific approach, learning process will be more memorable and meaningful to students, because make students getting new knowledge, is not depend on the one way information from teacher (Rahmani, 2016).

### **Analysis Activity**

The result of the activity of analysis which done by teacher use RPP as guidance. From RPP or lesson plan, it can be seen that not all RPP contains analysis activity.

“The implementation of scientific learning approach that involved 5M not always be done in one meeting of lesson. For example, in a meeting only contains observation and asking activity (W.1)”.

The result of observation shows that analysis activity were done in the first and the third meeting. In the first meeting, students analyzed the result of experiment of evaporation. Students were asked to compare the composition that placed under the direct sun and not in 15, 30, and 60 minutes. Then student made the report of it.

In the third lesson, students analyzed the difference between speeds of windmill. They were also asked about other difference. They wrote it in the form of diagram.

Activity of analysis activity as show in Figure 4.



**Figure 4.** The Analysis Activity

Based on Figure 4 it can be seen that students did the analysis in order to find the speed difference between windmills. Students wrote the report on the book. This analysis activity asked students to think creatively. Through the scientific approach, there will be a generation in Indonesia that is creative, innovative, productive, and affective that can bring the nation developed and civilized in the future (Machali, 2014).

### **Communicaton Activity**

This activity was also use RPP as guidance. It is the next step after analysis. Communication can be done individual or group.

“Scientific step of communication has been done after the analysis activity. This activity was done individually or in group (W.1)”.

The result shows that this activity was done in the first, third, and sixth. In the first meeting, the communication was done after students analyzed the evaporation. Students of a group presented the result of their experiment in front of their friend. In the third meeting, communication was done by comparing the speed of each windmills. In the sixth meeting, the communication activity was done after students made drawing about how to save the energy and exchange it to their friend. Students came forward to explain message of the picture made by their friend. Activity of communication activity as show in Figure 5.



**Figure 5.** Communication Activity

Based on the Figure 5 it can be seen that they did this activity in group. It indicates that scientific learning has successfully encourage them to be more confident. Rahmi (2017) stated that scientific learning had successfully made students be more active studying, braver, with the integrated understanding.

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### **CONCLUSION**

Based on the analysis of the result of research, the implementation of scientific approach with the theme Always Save the Energy in grade IV SDN 4 Penyangkringan uses observation, ask, and collect information, analysis, and communication. The scientific learning process has been done in the core activity. Observation was done based on the research, that students observed picture on the book and LCD, observed video prepared by teacher, observed thing directly, or paid attention to teacher’s explanation about the lesson. Asking activity was done to train students arrange question based on the lesson. The asking activity was done based on the result of observation. Trying activity and collect the information which done based on the group



experiment about evaporation, students sang a song, made windmill, then continued with experiment, student told their experience in using the electric equipment, and students draw picture of saving the fuel and tell it to their friend. The analysis and communication were not done in every lesson. The analysis activity done based on the result of experiment. Communication activity was done individually or in group.

## REFERENCES

- Ardiantari, N., Wiarta, I. W., & Manuaba, S. (2015). Penerapan Pendekatan Saintifik dengan Penilaian Proyek untuk Meningkatkan Kemampuan Pemecahan Masalah dan Hasil Belajar Pengetahuan Matematika Tema Cita-Citaku Siswa Kelas IV B SD Negeri 8 Pemecutan. *E-Journal PGSD Universitas Pendidikan Ganesha*, 3(1), 1–11.
- Arnawa, I. A., Suardika, I. W. R., & Ardana, I. K. (2015). Pengaruh Pendekatan Saintifik Terhadap Hasil Belajar Pengetahuan IPA Tema Tempat Tinggalku pada Siswa Kelas IV Ditinjau dari Karakteristik Pertanyaan Guru di SD Gugus Ki Hajar Dewantara. *E-Journal PGSD Universitas Pendidikan Ganesha*, 3(1), 1–11.
- Baedhowi, F. (2018). Pengembangan Modul Pelajaran Ekonomi Berbasis Saintifik untuk Meningkatkan Hasil Belajar Siswa SMA. *Lembaran Ilmu Kependidikan*, 47(1), 9–17.
- Creswell, J. W. (2016). *Research Design Pendekatan Metode Kualitatif, Kuantitatif, dan Campuran*. Yogyakarta: Pustaka Pelajar.
- Dewi, P., & Rochintaniawati, D. (2016). Kemampuan Proses Sains Siswa Melalui Pendekatan Saintifik dalam Pembelajaran Ipa Terpadu Pada Tema Global Warming. *Edusains*, 8(1), 18–26.
- Febriyanti, C. (2014). Peran Minat dan Interaksi Siswa dengan Guru dalam Meningkatkan Hasil Belajar Matematika. *Jurnal Formatif*, 4(3), 245–254.
- Gerde, H. K., Schachter, R. E., & Wasik, B. A. (2013). Using the Scientific Method to Guide Learning: An Integrated Approach to Early Childhood Curriculum. *Early Childhood Education Journal*, 41(5), 315–323. <https://doi.org/10.1007/s10643-013-0579-4>
- Hosnan, M. (2014). *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia.
- Indriawan, R., Slamet, A., & Kardoyo. (2018). Implementation of Scientific Learning Approach in Economic Learning. *Journal of Economic Education*, 7(1), 18–23.
- Kamaliyah. (2016). Mendesain dan Melaksanakan Pendekatan Saintifik dalam Pembelajaran Matematika. *EDU-MAT Jurnal Pendidikan Matematika*, 4(2), 114–123.
- Kiptiyah, S. M., Masrukan, & Putra, N. M. D. (2016). Kemampuan Berpikir Kreatif Pada Problem Based Learning Ethnomathematics Berdasarkan Minat Belajar. *Journal of Primary Education*, 5(2), 104–112.
- Kusmaryono, I., & Suyitno, H. (2016). The Effect of Constructivist Learning Using Scientific Approach on Mathematical Power and Conceptual Understanding of Students Grade IV. *Journal of Physics: Conference Series*, 1(1), 1–10. <https://doi.org/10.1088/1742-6596/693/1/012019>
- Machali, I. (2014). Kebijakan Perubahan Kurikulum 2013 dalam Menyongsong Indonesia Emas Tahun 2045. *Jurnal Pendidikan Islam*, 4(1), 71–94. <https://doi.org/10.14421/jpi.2014.31.71-94>
- Machin, A. (2014). Implementasi Pendekatan Saintifik, Penanaman Karakter dan Konservasi pada Pembelajaran Materi Pertumbuhan. *Jurnal Pendidikan IPA Indonesia*, 3(1), 28–35.
- Maduretno, T. W., Sarwanto, & Sunarno, W. (2015). Pembelajaran IPA dengan Pendekatan Saintifik Menggunakan Model Learning Cycle dan Discovery Learning Ditinjau dari AKtivitas dan Motivasi Belajar Siswa Terhadap Prestasi Belajar. *Jurnal Pendidikan Fisika Dan Keilmuan*, 2(1), 1–11.
- Mahmudah, C. (2016). Pengembangan Perangkat Pembelajaran Statistika Smp Dengan Pendekatan Saintifik. *Jurnal Riset Pendidikan Matematika*, 2(2), 173–183. <https://doi.org/10.21831/jrpm.v2i2.7348>
- Niron, sesilia K. (2016). Pelaksanaan Pendekatan Saintifik dalam Pembelajaran di Kelas IV SD Negeri Nirmala Kabupaten Bantul. *Jurnal Pendidikan Guru Sekolah Dasar*, 7(5), 666–673.
- Nivianto, A., & Mustadi, A. (2015). Analisis Buku Muatan Tematik Integratif, Scientific Approach, dan Authentic Assessment Sekolah Dasar. *Jurnal Kependidikan*, 45(1), 1–15.

- Rahmani. (2016). Pengaruh Pendekatan Saintifik Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Serambi Ilmu*, 27(2), 299–303.
- Rahmi, F. (2017). Penerapan Pendekatan Saintifik Sebagai Upaya Meningkatkan Hasil Belajar IPA Siswa Kelas IV SDN 19 Koto Tinggi. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, 1(2), 1–15.
- Saeroji, A., Slamet, A., & Khafid, M. (2018). Scientific Learning Approach on Subject Material Computer Application for Financial Administration. *Journal of Economic Education*, 7(1), 10–17.
- Said, I. M., Sutadji, E., & Sugandi, M. (2016). The Scientific Approach-Based Cooperative Learning Tool for Vocational Students Vocation Program of Autotronic ( Automotive Electronic ) Engineering. *IOSR Journal of Research & Method in Education*, 6(3), 67–73. <https://doi.org/10.9790/7388-0603046773>
- Sumayasa, I. N., Marhaeni, N., & Dantes, N. (2015). Pengaruh Implementasi Pendekatan Saintifik Terhadap Motivasi Belajar dan Hasil Belajar Bahasa Indonesia pada Siswa Kelas VI di Sekolah Dasar se Gugus VI Kecamatan Abang Karangasem. *E- Journal Program Pascasarjana Universitas Pendidikan Ganesha*, 5, 1–11.
- Treagust, D. F., Chittleborough, G., & Mamiala, T. L. (2002). Students' understanding of the role of scientific models in learning science. *International Journal of Science Education*, 24(4), 357–368. <https://doi.org/10.1080/09500690110066485>
- Wibowo, A. (2017). Pengaruh Pendekatan Pembelajaran Matematika Realistik dan Saintifik terhadap Prestasi Belajar, Kemampuan Penalaran Matematis dan Minat Belajar. *Jurnal Riset Pendidikan Matematika*, 4(1), 1–10.