



## LEARNING SCIENCE PROCESS SKILLS (SPS) IN JUNIOR HIGH SCHOOL WATULIMO DURING THE PANDEMIC COVID-19

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### Abstract

This study aims to determine the application of learning science that involves science process skills (SPS) during the pandemic Covid-19. This research uses case study method with the research subject 5 science teacher and 15 students from 3 junior high school in Watulimo. The instrument of this study consists of questionnaire of teachers and students, with data collection techniques used were interviews, observation, and documentation. Results showed a decline in the application of SPS from learning offline to online. The decline is most obvious elements of the SPS integrated to formulating hypotheses, interpreting data, and conducting experiments with 1 of the 5 teacher respondents who apply it in science learning. These results indicate a low integrated SPS students. Factors that influence the low integrated SPS the term learning material used by teachers and not specific instruments to assess SPS. The results of this study as input for the junior high school science teacher to adjust the term learning material used to be used in online learning and special instruments to assess SPS (student worksheet that contain SPS material), so that students are able to develop.

**Keywords:** Science Process Skills, Pandemic Covid-19, Junior High School Watulimo, Case Studies

## INTRODUCTION

Plague COVID-19 (Corona Virus Disease) since December of 2019, which is rumored to come from Wuhan city (Lee, 2020). According to (Sunitha, Anburaj, & Sandra, 2020) on March 11, 2020, the WHO declared COVID-19 has become a pandemic ongoing started in December 2019. The pandemic is affecting to the social, cultural, economic, and education. According to (Sun, Tang, & Zuo, 2020) the government pursue the process of learning still takes place by road establish and implement policy learn from home or online learning. This is supported by the circular letter of the Minister of Education and Culture the Number 4 2020 on the implementation of education in times of emergency covid disease (Covid-19), that the purpose of the implementation of learning from home is to ensure the fulfillment of the rights of learners to get educational services during the emergency Covid-19, prevent the transmission and spread of Covid-19 in the education unit, protect the unit of citizen education from the impact of bad Covid-19 and ensure the fulfillment of psychosocial support for educators, learners and parents.

Policy about learning from this house, to be applied in all levels of education, is no exception education at junior high school level in Watulimo Trenggalek (Purwanto, Kanali Indonesia, 2020). As a result of learning this online, pose a challenge for teachers and students, students have the limitations of the facilities owned, while the teacher has the challenge of changing the way or a method of delivery of material so that only part of the skills trained to the students (Setyorini, 2020).

Skills are important for trained to students are the Science Process Skills (SPS) because it is one of the thinking skills most often used, so that if the individual can not use this skill, then it will experience difficulties in daily life (Saleh, Muhiddin, & Rusli, 2020). Science Process Skills (SPS) consists of two types of basic process skills and integrated process skills. Basic skills process is a prerequisite for obtaining integrated SPS (Rauf, Mansor, Othaman, & Lydon, 2014). According to (Silay & Celik, 2013), basic SPS consists of observing, classifying, measuring, communicating, predicting, and understanding, while the integrated SPS including formulating a hypothesis, interpreting data, formulating models, experimenting, and identifying and controlling variables.

Observations conducted by the researcher with the interview to one of the science teachers of junior high school in Watulimo, be aware that there are differences in the method of delivery of material involving SPS. According to the

respondents, on the topic of the student activity try to make the scale of the liquid thermometer. When learning offline, this activity usually done in a laboratory, but when the learning is implemented online such activities are not assigned to students because of the limitations of tools and materials. In addition, note the difference in the learning method and content of basic source outline used in each school.

Based on the explanation above, is used into the topic of the research with the title "Learning Science Process Skills (SPS) in Junior High School Watulimo During the Pandemic Covid-19". The purpose of this study is to determine the application of science learning that involves the SPS during the pandemic Covid-19. This research focuses on the material class VII semester 1 namely Temperature and Changes by limiting basic SPS (observing, understanding, and communicating) and integrated SPS (formulating hypotheses, interpreting data, and conducting experiments). The restriction of SPS is done because the sixth SPS above are the absolute existence in the material Temperature and Changes

## METHOD

This research uses case study method. According to (Yin, Case Study Research and Applications, 2017) this method is an inquiry empirically investigating the phenomenon in real life and utilize multi-source evidence.

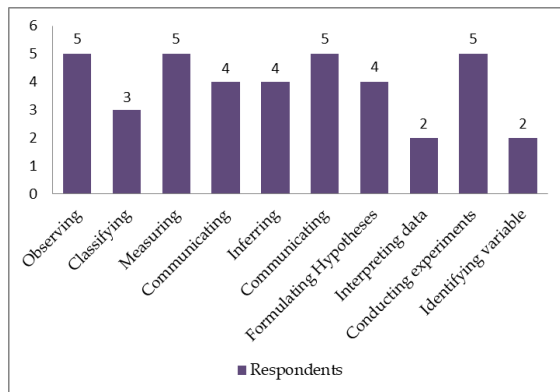
Participants this study is a science teacher at 3 junior high school in Watulimo as much as 5 people and 15 students from three schools. The selection of schools is based on the category of accreditation, that is in SMP N 1 Watulimo with A accreditation, SMP N 2 Watulimo with A accreditation, and SMP N 3 Watulimo with B accreditation. In addition, based on the early stages of research known basic source outline each school, has the distinction of content and learning methods used.

Data collection techniques used were interviews, observation, and documentation. The implementation of this study includes the stages of pre-field research and data analysis. The stage of pre-field includes make a letter of research permission and analysis of the basic source outline & student worksheet each school. Interview technique used is unstructured technique where researchers do not use questions that have been prepared before research (Sugiyono, 2015). The technique of observation was done indirectly through questionnaires teacher and student responses are presented in the form of a *Google Form*. The results at this stage, will be analyzed

by researcher as the research data. The validity of the data obtained is tested using triangulation of sources method (Sayed & Kinasih, 2018). Documentation technique used as a recap of the entire research activities in the form of photos of related objects and term learning material. Data processing in this study using methods of descriptive data analysis. According to (Sugiyono, 2015) this method is an analysis based on the data obtained, further developed according to the pattern of a certain relationship.

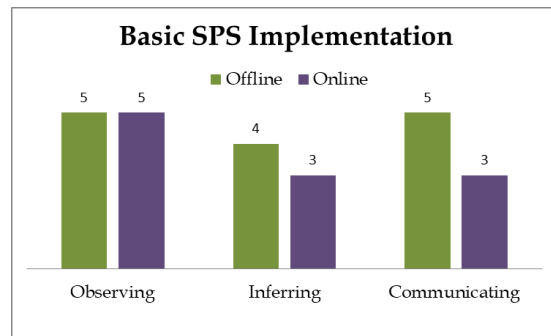
**RESULTS AND DISCUSSIONS**

Based on Figure 1 below, shows the differences in SPS used by science teacher on the material Temperature and Changes during the learning offline and online.



**Figure 1.** Implementation of SPS in the topic Temperature and Changes

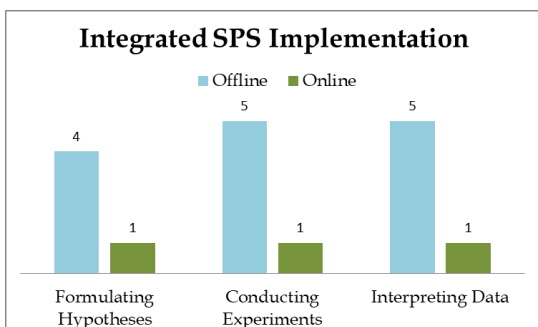
If you pay attention, the overall application elements of the SPS on science learning in junior high school Watulimo is vary. The highest application elements are the observe, measure, communicate, and conduct experiments is applied as many as 5 respondents. The elements of the SPS that the absolute existence on the topic of Temperature and Changes basic SPS including observing, understanding, and communicating and integrated SPS including formulating hypothesis, interpreting data, and conducting experiments. Based on the analysis results of the respondent's science teacher on the implementation of the basic SPS is obtained as Figure 2 below.



**Figure 2.** Implementation of Basic SPS

If you pay attention, the elements of the observe, and communicate during the learning offline applied by all science teacher respondents, while elements of the understanding applied by 4 out of 5. Based on the results of the analysis of the respondents, at the time of learning offline science teacher often provides the topic of discussion to be observed and inferred, then after the results of observation of students is well formed, the teacher asks students to communicate in front of the class, while on the online learning element of the observe applied by all respondents while the elements of understanding and communicating the applied by 3 of the 5 respondents. The results of this study are relevant to (Eliyana, 2020) research, which gave rise to the elements of observing, understanding, and communicating the when to lessons online. Supported by the student's response, who stated that the elements observed are only applied by 10 of the 15 students and elements of the derived applied 6 of 15 students. On the other hand, according to (Rahman, Wahyuni, & Rifqiawati, 2017), the skills of observing, interpreting data and classifying the data have been steadily mastered in the child class VI (age 11-12 years).

In addition to basic science process skills as spelled out above, integrated science process skills on the topic of Temperature and Changes are also analyzed in this study. (Hamadi, 2018) explains that the integrated SPS is a skill directly used in solving problems or doing science experiments.



**Figure 3.** Implementation of Integrated SPS

Based on Figure 3, the elements performing the experiments and interpreting the data during the learning offline in Junior High School Watulimo applied by all science teacher respondents, while the elements formulating hypotheses applied by 4 of 5 respondents. Elements formulating hypotheses, conducting experiments, and interpreting data at a time when online learning is only applied by 1 of 5 respondents. Based on the results of the respondent's analysis, the majority of the science teachers only give impressions video of the experiment without asking students to practice it at home, then just collect the results of the discussion. As a result, the skills of students to formulating hypotheses and interpreting data is not perfectly conveyed. According to (Sifah & Sumarno, 2016) skills to formulate the problem and need the motivation and stimulus to increase the curiosity of students. Some students claimed never to formulate the problem better when the lesson or the time of carrying out the practicum, so that based on the student's response analysis, skills to formulate a hypothesis is only achieved by 5 of the 15 students. Similarly, in the skills of interpreting data, so that based on the student's response analysis was achieved by 2 of the 15 students.

Based on the analysis that has been conducted on basic and integrated science process skills above, a decline in the implementation of significant on the material Temperature and Changes, on the elements of the integrated SPS to formulating hypothesis, interpreting data and conducting experiments. Factors that influence the low integrated SPS is basic source outline used by teachers. According to the results of the analysis of the respondents, some of the sampled schools using term learning material with the methods of learning *Mix Learning*. According to Nur Arifin (the Regent of Trenggalek), with the *Mix Learning* method or the mix of applied study groups were divided into several groups with each 10 students. In addition, teachers have yet to make own students' worksheet to trained elements of the

SPS. Based on the findings in the field, all teachers at the junior high school Watulimo refers to the Book Companion Material Curriculum 2013 Science published by Science MGMP Trenggalek Team. The content of the book is generally the same with books BSE Science VII Semester I Curriculum 2013, Revision 2017. Only, the sequence of the topics in the MGMP book are arranged randomly in accordance with the topics to be taught to the students for one year.

Policy online learning during the pandemic Covid-19 poses a challenge of its own in culture and science process skills for teachers and students. Based on the results of the analysis of the respondents, there are some constraints experienced by teachers, 1) a lot of students who do not respond immediately when learning activities take place; 2) not all students want to follow the activities of learning online; 3) many students no mentoring while participating in learning, and 4) many students are still difficulties in making hypothesis and conclusions in science learning. (Hamadi, 2018) added constraints inhibiting the application of skills science process including, 1) the time to learn less while the science material quite a lot, 2) the background of the learners is different. The solution of these problems according to the respondents, always enable *WhatsApp* to monitor students who are experiencing difficulties, often contact students to remind complete a task, give direction how to create a hypothesis and a conclusion.

Dewi (2020) added problems of the lack of application of science process skills that not only comes from students but also can be sourced from the teacher. Among the teachers have not been able to make both their own science student worksheet and the instrument contain SPS material. Things that can be done to overcome these problems include, 1) the teacher must familiarize the application of science process skills in science learning; 2) the instrument specifically to assess science process skills, so that students are able to developed in a focused his science process skills; 3) held the training of science process skills periodically to the teachers, good for the development of science student worksheet, especially the science process skills and the development of the instrument science process skills (Saleh, Muhiddin, & Rusli, 2020).

## CONCLUSION

Based on the research results above, it can be concluded that the application of science learning that involves the SPS during the pandemic Covid-19 decreased the application of the transitional learning offline to online. The decline is most

obvious elements of the SPS integrated to formulating hypotheses, interpreting data and conducting experiments with 1 of the 5 teacher respondents who apply it in science learning. Based on the student's response analysis, elements of the conducting experiments are applied by 4 of the 15 students, elements formulating hypothesis can be achieved by 5 of the 15 students and the element of interpreting data can be achieved 2 of the 15 basic source outlines used by teachers and not specific instruments to assess SPS. The results of this study are used as input for the science teacher junior high school to adjust the lesson plan in order to be used in online learning and special instruments to assess SPS (student worksheet that contain SPS material), so that students are able to develop.

## REFERENCES

- Dewi, W. A. 2020. Dampak Covid-19 terhadap implementasi pembelajaran daring di Sekolah Dasar. *Jurnal Ilmu Pendidikan*, Vol. 2, No. 1, pp 55-61.
- Eliyana, E. 2020. Analisis Keterampilan Proses Sains Siswa Belajar Ipa Materi Tumbuhan Hijau Pada Siswa Kelas V Sdn 3 Panjerejo Di Masa Pandemi Covid-19. *EDUPROXIMA: Jurnal Ilmiah Pendidikan IPA*, Vol. 2, No. 2, 87.
- Hamadi, A. A. 2018. Pemahaman Guru Terhadap Keterampilan Proses Sains (KPS) dan Penerapannya Dalam Pembelajaran IPA SMP Di Salatiga. *Jurnal Pendidikan Sains dan Matematika*, Vol. 6, No. 2, pp.
- Kane, S. N., Mishra, A., & Dutta, A. K. 2020. Preface: International Conference on Recent Trends in Physics (ICRTP 2016). *Journal of Physics*.
- Lee, A. 2020. Wuhan Novel Coronavirus (COVID-19): Why Global Control is Challenging? *Public Health*, 179.
- Mustakim. 2020. Efektivitas Pembelajaran Daring Menggunakan Media Online Selama Pandemi Covid-19 Pada Mata Pelajaran Matematika the Effectiveness of E-Learning Using Online Media During the Covid-19 Pandemic in Mathematic. *Al Asma: Journal of Islamic Education*, Vol. 2, No. 1, pp. 1-12.
- Purwanto, A. 2020. Kanali Indonesia. Retrieved Januari 21, 2021, from Unas dan UAS Ditiadakan, Disdikpora Trenggalek Perpanjang Sekolah Di Rumah: <https://kanalindonesia.com/88750/2020/04/03/unas-dan-uas-ditiadakan-disdikpora-trenggalek-perpanjang-sekolah-di-rumah/>
- Rahman, A., Wahyuni, I., & Rifqiawati, I. 2017. Profil Keterampilan Proses Sains dan Sikap Ilmiah Siswa di SMP Satu Atap Pulau Tunda. *SEJ*, Vo. 5, No. 1.
- Rauf, R., Mansor, Othaman, & Lydon. (2014). Inculcation of Science Process Skills in a Science Classroom. *Asian Social Science*, Vol. 9, No. 8, pp. 47-57.
- Ray, S., & Srivastava, S. 2020. Virtualization of Science Education: a lesson from the COVID-19 pandemic. *Journal of Proteins and Proteomics*, Vol. 11, pp. 77-80.
- Saleh, S. Y., Muhiddin, N. H., & Rusli, M. A. 2020. Studi Ketrampilan Proses Sains (KPS) Peserta Didik Kelas VIII SMP Negeri 12 Makasar. *Jurnal IPA Terpadu, JIT*, Vol 3, No. 2, pp. 75-86.
- Sayekti, I. C., & Kinasih, A. 2018. Kemampuan Guru Menerapkan Keterampilan Proses Sains Dalam Pembelajaran Ipa Pada Siswa Kelas Iv B Sdm 14 Surakarta. *Profesi Pendidikan Dasar*, Vol. 1, No. 1, pp. 93.
- Setyorini. 2020. Terhadap Proses Pembelajaran Pada Kurikulum 13. *Jiemar*, pp. 95-102.
- Sifah, L., & Sumarno. 2016. *Profil Keterampilan Proses Sains (KPS) Siswa SMP NegeriSe-Kota Semarang*. Malang.
- Silay, I., & Celik, P. 2013. Evaluation of Scientific Process Skills of Teacher Candidates. *Procedia-Social and Behavioral Sciences*, pp. 1122-1130.
- Sugiyono. 2015. *Metode Penelitian Kualitatif, kuantitatif dan Pengembangan*. Bandung: Alfabeta.
- Sun, N., Tang, Y., & Zuo, W. 2020. Coronavirus Pushes Education Online. *Nature Materials*, Vol. 19, No. 6, pp. 687-688.
- Sunitha, V., Anburaj, & Sandra, C. S. 2020. From Epidemic to Pandemic Covid-19 Physiological, Social and Enviromental Impac - A Qualitative Study International. *Journal of Advanced Science and Technology*, pp. 4883-4893.
- Yin, R. K. 2017. *Case Study Research and Applications*. Sage Publications: Thousand Oaks CA.
- Ziedan, A. H., & Jayosi, M. R. 2015. Science Process Skills and Attitudes toward Science among alestinian Scodary School Students World. *Joyrnal of Education*, Vol. 5, No. 1.