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# Profile Analysis of Basic Science Process Skills for Students of SMP Negeri 2 Pagaralam Using the Test of Basic Process Skills

**Hartono[1], Melly Ariska[2*] & Rahmi Susanti[3]**

[1]Department of Chemistry Education Universitas Sriwijaya, Indonesia

[2*]Department of Physics Education Universitas Sriwijaya, Indonesia

[3]Department of Biology Education Universitas Sriwijaya, Indonesia

**Abstract:** The purpose of this study was to describe the basic science process skills of the students of SMP Negeri 2 Pagaralam City. The study used a dominant-less dominant design with purposive sampling technique. The research was conducted at SMP Class VIII with a population of all class VIII students at SMP Negeri 2 Kota Pagaralam. The sample used was 18 students of class VIII at SMP Negeri 2 Pagaralam City. The results of the research conducted showed that: (1) grade VIII students at SMP Negeri 2 Pagaralam City on average had basic science process skills at a moderate level in solving questions using a valid instrument, namely the Test of Basic Process Skill (BAPS) as many as 36 questions. science process skills (2) student achievement for each indicator, namely observation by 65%, communication by 61%, clarification by 58%, measurement by 27%, prediction by 32%, and inference by 57%.

**Keywords:** science process skills, test of basic process skills (BAPS)

***Abstrak:*** *Tujuan penelitian ini adalah untuk mendeskripsikan keterampilan proses sains dasar siswa SMP Negeri 2 Pagaralam Kota. Penelitian ini menggunakan desain dominan-kurang dominan dengan teknik purposive sampling. Penelitian ini dilaksanakan di SMP Kelas VIII dengan populasi seluruh siswa kelas VIII SMP Negeri 2 Kota Pagaralam. Sampel yang digunakan adalah 18 siswa kelas VIII SMP Negeri 2 Kota Pagaralam. Hasil penelitian yang dilakukan menunjukkan bahwa: (1) siswa kelas VIII SMP Negeri 2 Kota Pagaralam rata-rata memiliki keterampilan proses sains dasar pada tingkat sedang dalam menyelesaikan soal dengan menggunakan instrumen yang valid yaitu Tes Keterampilan Proses Dasar (BAPS) sebanyak 36 pertanyaan. keterampilan proses sains (2) prestasi belajar siswa pada masing-masing indikator yaitu observasi sebesar 65%, komunikasi sebesar 61%, klarifikasi sebesar 58%, pengukuran sebesar 27%, prediksi sebesar 32%, dan inferensi sebesar 57%.*

***Kata kunci:*** *keterampilan proses sains, tes keterampilan proses dasar (BAPS)*

## ▪ INTRODUCTION

Science learning relies on evidence and facts that are observed in everyday life. Therefore, students are required to have skills in managing thoughts to be able to build self-understanding of various contexts of phenomena that are packaged in a teaching material. Science Process Skills (SPS) accommodates students to be able to understand all the concepts and knowledge of students in understanding science. Skill means the ability to use thoughts, reasoning, and actions efficiently and effectively to achieve a certain result, including creativity (Erlida Amnie & Abdurrahman, 2014). While the process can be defined as a complex set of skills used by scientists in conducting scientific research.

The process can also be broken down into components that a person must master when conducting research (Puspita et al., 2021). Science process skills are skills that

Melly Ariska
*Email: mellyariska@fkip.unsri.ac.id

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involve all students' abilities in obtaining knowledge based on phenomena. The student's abilities in question are observation, communication, classification, measurement, prediction and inference skills (S, Frafti Rejeki & Usman, 2020). In relation to KPS, students must keep up with the times entering the Society 5.0 era which fully uses technology as a tool in the learning process.

For almost the last 20 years since PISA released the results of scientific literacy abilities of students around the world, the State of Indonesia has always been at the bottom. This shows that the quality of science learning in Indonesia is far below the OECD member countries (Lestari & Diana, 2018). Scientific literacy is important to face questions in life that require a scientific way of thinking (Pambudi et al., 2013). The literacy ability due to the application of ethnoscience integrated science teaching materials showed a significant difference with the control class which only used BSE books as teaching materials based on the results of the t-test. The results of the implementation of learning using integrated science teaching materials ethnoscience of smoking fish have been proven to improve students' scientific literacy compared to using BSE textbooks (Yuliati, 2016).

Scientific literacy skills can be trained by applying learning that utilizes the social and cultural environment (ethnoscience) as a source of learning in everyday life (Kastawaningtyas & Martini, 2018). The application of the Ethnoscience-based science module in learning soil and life-sustaining science to train students' scientific literacy has a better literacy rate than learning without applying the Ethnoscience-based science module. An ethnoscience-based science learning module on global warming material that has been declared valid (appropriate) and effective for training students' scientific literacy skills (Yuliati, 2016b).

SPS is a skill that involves cognitive or intellectual, manual and social skills. Cognitive skills are involved because by doing science process skills, students use their minds. Manual skills are involved because science process skills involve the use of tools and materials, measurement and preparation or assembly of tools and materials (Kartimi et al., 2013). And social skills are learning activities with science process skills.

Science process skills can also be interpreted as the ability or skill to carry out an action in learning science so as to produce concepts, theories, principles, as well as laws or evidence. Teaching science process skills to students means giving them the opportunity to do something, not just talk about something about science (Ali, 2018). In line with that (Kastawaningtyas & Martini, 2018) said that according to its characteristics science is related to seeking knowledge about nature systematically, not only facts, concepts and principles but emphasizes discovery.

Process skills in the natural sciences (science): knowledge and concepts and principles can be obtained by students if they have certain basic abilities, namely the science process skills needed to use science (Kurniawan, 2016). Skills in the field of science include: observing, classifying, communicating, measuring, recognizing and using the relationship between space and time, drawing conclusions, developing operational definitions, determining hypotheses, controlling variables, interpreting data, and experimenting (Erlida Amnie & Abdurrahman, 2018).

Based on the above definition, it can be concluded that science process skills are acquisition processing skills, so that students will be able to discover and develop concepts, theories, legal principles and facts. Process skills also involve students to

achieve conceptual understanding by engaging directly in an experiment related to understanding concepts, such as the student's abilities include observing, communicating, classifying, measuring, predicting and inference skills.

The goals of Science Process Skills are increasing students' learning motivation and learning outcomes, because by practicing science process skills students are encouraged to participate actively and efficiently in learning. Complete the learning outcomes of students simultaneously, both product skills, processes, and performance skills, determine and build their own conceptions and can define them correctly to prevent misconceptions and deepen the concept of understanding, and the facts they learn because by practicing process skills, students themselves are trying to find and find these concepts. Developing knowledge of theories and concepts with realities in people's lives. Science process skills consists of several main components, namely the basic (simple) process skills and integrated (more complex) process skills. The basic process skills consist of 1) observing, inferring, measuring, communicating, and classifying, predicting. Meanwhile, the integrated process skills include controlling variables, defining operationally, formulating hypotheses, interpreting data, experimenting and formulating models (Rauf et al., 2013).

All these process skills, both basic process skills and integrated process skills are very important to have and be trained on students in the learning process. Process skills consist of a number of skills that cannot be separated from each other, but there is a special emphasis in each of these process skills. Aspects of science process skills consist of observing, classifying/measuring, communicating, interpreting data, predicting, using tools, conducting experiments, and concluding (Utami et al., 2020).

## ▪ METHOD

### Participants

The type of research used is research with the type of mix method which is a reaserch that combines qualitative and quantitative research types. This research was conducted in July 2022 at SMP Negeri 2 Pagaralam City for the academic year 2021/2022 even semester. The population used in this study were all eighth graded students of SMP Negeri 2 Pagaralam City. The sample used in this study was class VIII, totaling 18 students of SMP Negeri 2 Pagaralam City. The sampling technique used was purposive sampling technique. The research design in this study used an explanatory sequential design mixed methods which were dominant-less dominant.

### Instrument

The instrument for the question of Basic Science Process Skills uses an instrument that is already valid, namely using the Test of Basic Process Skills (BAPS) instrument with modifications to several questions related to the subject matter of Pressure on Substances and Its Application. The following is a modified research design from (Putri et al., 2021). The test instrument used consisted of tests and interviews, the test given consisted of 36 multiple choice questions. In this multiplechoice test, it has been categorized based on the indicators.

### Research Design and Procedures

Basic Science Process Skills consisting of observing, predicting, classifying, interfering, communicating, and measuring. These categories will clearly show how students are able to answer questions according to the context of the questions and their

categories. The multiples choice test already includes indicators of students' science process skills. The indicators of students' science process skills used are observing, predicting, classifying, interfering, communicating, and measuring

**Table 1.** Question number in each indicator

| No | Indicators | Items |
|---|---|---|
| 1 | Observing | 2.13.15.16.30.33 |
| 2 | Communicating | 8.19.20.21.22.27 |
| 3 | Classifying | 4.7.11.18.31.35 |
| 4 | Measuring | 1.5.14.23.29.36 |
| 5 | Predicting | 3.10.12.17.25.32 |
| 6 | Interfering | 6.9.24.26.28.34 |

This science process skills test is conducted on students who have obtained the material on stress on substances and their application. While the interview sheets were conducted to support the results of the science process skills test that had been done by the students.

**Data analysis**

The data analysis technique only consisted of validating language experts as well as science education experts in translating BAPS questions because the basic science process skills questions were already valid. Quantitative data using the student's science process skills test aims to determine the science process skills possessed by students after getting the material.

While the qualitative data uses data analysis model Miles and Huberman which includes 4 stages, namely, data collection (data collection), data reduction (data reduction), data display (presentation of data), conclusion / verification (conclusions / analysis). To find out the results of the student's science process skills test, it can be calculated by the following formula:

$$Percentage = \frac{R}{SM} X\ 100\%$$

Descriptions :
P : Persentage
R : Student’s Scors
SM : Maximum Scors

The calculation results are interpreted using the criteria according to Table 1 below.

**Table 2.** Science process skills assessment criteria

| Percentage (%) | Criteria |
|---|---|
| 75.05 < X | Very High |
| 58.83 < X ≤ 75.05 | High |
| 41.65 X ≤ 58.83 | Moderate |
| 24.95 < X ≤ 41.65 | Low |
| X ≤ 24.95 | Very Low |

## ▪ RESULT AND DISSCUSSION

The science process skills test was conducted on 18 eighth grade students at SMP Negeri 2 Pagaralam. Students take online tests via the google form link and then their respective answers are sent and analyzed. This research was conducted in two stages, the first through a test given after the test results were obtained, the data were then analyzed quantitatively, grouped into high, medium, low categories and two subjects from each of these categories were selected as resource persons for interviews.

The selection of subjects for each group was based on the answers in each group category and good enough communication skills so that the subject was able to understand and answer interview questions well. Based on the research results, it can be seen that the science process skills of class VIII students are divided into three groups. The groups include the high group, medium group and low group. The frequency and percentage of each group can be seen in Table 2 below

**Table 3.** Percentage of each group category

| Group Category | Frequency | Percentage |
|---|---|---|
| High | 2 students | 11 % |
| Moderate | 13 students | 72 % |
| Low | 3 students | 17% |
| Total | 18 students | 100 % |

Table 3 shows that of the 18 class VIII students there are 2 students who are included in the high group with a percentage of 11%. 13 students belong to the medium group with a percentage of 66.67% and as many as 3 students belong to the low group with a percentage of 17.00%. The science process skills of class VIII students are still not optimal, so there are still many students who are in the medium category.

According to Ramzi (2019) regarding the theory of meaningful learning (meaningful learning) explains that learning is a process of connecting new information with relevant concepts and contained in one's knowledge structure (S, Frafti Rejeki dan Usman, 2020). Class VIII students have obtained the concept of material pressure on substances and their applications, but are still unable to connect their knowledge with new information to be able to connect them with science process skills. Therefore, the science process skills of class VIII students are dominated by the medium group. The percentage of each indicator shows how much achievement each indicator of science process skills has achieved by class VIII students at SMP Negeri 2 Pagaralam City. The following percentage of indicator data as a whole can be seen in Table 3.

**Table 4.** Percentage of sps for each indicator

| No | Indicators | Percentage (%) |
|---|---|---|
| 1 | Observing | 65 % |
| 2 | Communicating | 61% |
| 3 | Classifying | 58 % |
| 4 | Measuring | 27 % |
| 5 | Predicting | 32 % |
| 6 | Interfering | 57 % |

Table 4 explains that grade VIII students have different percentages on 6 indicators of science process skills. Can be seen which has the highest score for all indicators, namely indicators observing with a percentage of 65.00%. Similar findings were also expressed by (Samsudin, 2020) which stated that the highest aspect of students' science process skills was the observing aspect and findings (Kartimi et al., 2013) also showed that the observing aspect had the highest score very well. Then the science process skills of students who have the lowest score of the six indicators of science process skills are measurement indicators with a percentage of 27.00%.

The first indicator is observing with a percentage of 65.00%. The results of the percentage analysis indicate that students are able to observe the given problem. On Observing indicators, students are asked to observe illustrative images related to the amount of pressure on a substance through the size of its cross-sectional area with the aim that students are easier to answer the questions that have been given.

From the data above, it can be seen that the observing indicator has the highest percentage, the importance of science process skills for observing indicators in the teaching and learning process, namely students will be easy to be active, in this aspect students will use all their five senses. This is in accordance with (Juhji, 2016) that observing indicators are basic scientific skills and observing students must be able to use all their five senses including seeing, hearing, feeling, tasting and smelling.

The second indicator is communication. The percentage analysis of communicating indicators gets a percentage value of 61%. The results of the percentage analysis indicate that the indicators of communicating can be achieved by students so that they can solve the questions that have been given and detail the questions so that they can answer the questions in their own way with the knowledge they already have after learning. This is in line with (Pambudi et al., 2013) students are encouraged to find and construct their own knowledge in their minds through the use of scientific process skills and scientific attitudes, so that students do not just memorize knowledge but understand all the existing contexts.

The third indicator is classification. The percentage value of grouping indicators is 58%. The results of the percentage analysis indicate that the indicators classify the same as the previous indicators that are able to be achieved by students so that the results obtained from these indicators indicate that students are able to answer questions in detail based on their knowledge. In the matter of classifying/grouping indicators based on their type and shape, students are asked to group objects based on their characteristics, properties and shapes. In line with the statement (Diella & Ardiansyah, 2019) that the purpose of teaching in process skills is to provide opportunities for students to work with science, not just tell or hear about science.

The fourth indicator is measurement. The percentage analysis of the measuring indicator gets a percentage value of 27%. The results of the analysis show that the indicators of measuring data are difficult for students to achieve. In measuring indicators, students are asked to analyze a graph or table by determining the relationship between the magnitude of the pressure on the surface area of the object and expand learning through experience and develop the knowledge gained. In line with the statement (Samsudin, 2020) that in science, basic science process skills help children expand learning through experience. Students start with simple ideas, and progress to form new and complex ideas.

The fifth indicator is prediction. The predictive percentage value of the indicator is 32%. The percentage value obtained shows that the predictive indicator is the second low percentage after the indicator measures. The low predictive indicator can occur due to several factors, including students' unfamiliarity in predicting or predicting a lesson, lack of accuracy of students in working on questions and lack of seriousness of students when participating in the learning process.

The sixth indicator is inference. The percentage value of the inference indicator is 57%. The percentage value obtained shows that science process skills make students able to infer or conclude observations from the problems that have been done. In the inference indicator, students are asked to conclude and analyze the data obtained from the questions in detail. Students answer the questions with their own thoughts, but they are not sure about the answers. According to (Rahayu et al., 2021) inference skill is the result of observation (skill inferring) which is an aspect of basic PPP which is also related to social skills. The percentage of achievement of each indicator as a whole is presented Figure 1.

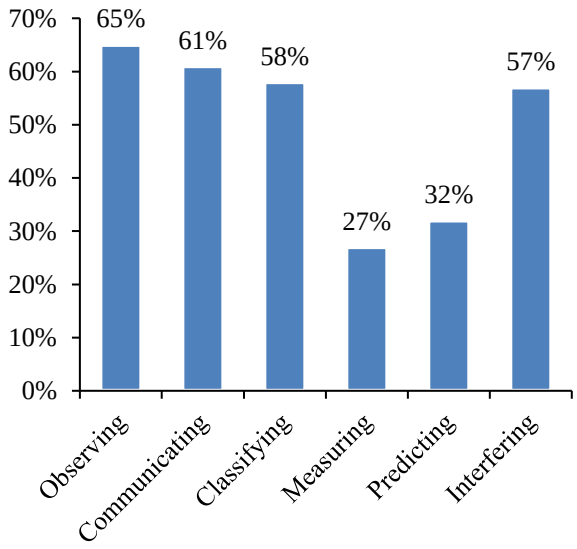


**Figure 1.** Students' achievements per SPS indicator

Based on the discussion above, it can be shown that the VIII grade SMP students at SMP Negeri 2 Pagaralam City mostly already have science process skills by being able to solve the given questions, only the skills of measuring and predicting data get the lowest percentage. Therefore, it is necessary to improve the quality of learning to improve students' measuring and predicting skills. Learning also needs to be stimulated so that other science process skills also increase. These students' science process skills require teachers to be able to develop, design and create a science learning process that is able to develop students' science process skills.

## ▪ CONCLUSION

Based on the results of data analysis and discussion, the following conclusions are obtained: the results of the percentage of students' science process skills for each

indicator, namely, observing 65%, communicating 61%, classification 58%, measuring 27%, predicting 32% and inference 57%. Based on these percentages, it can be seen that the highest indicator achieved by students is the indicator of observing, while the lowest indicator that is difficult for students to achieve is the indicator of measurement. As for suggestions regarding this research, namely the analysis of science process skills only presents the material Pressure on Substances and its application, so it is hoped that further research can be made on other science learning materials that can improve students' science process skills.

## ▪ REFERENCES


Ali, L. U. (2018). *Pengelolaan pembelajaran ipa ditinjau dari hakikat sains pada smp di kabupaten lombok timur*. *Prisma Sains : Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, *6*(2), 103. https://doi.org/10.33394/j-ps.v6i2.1020

Ariska, M., Akhsan, H., Muslim, M., Sudirman, S., & Kistiono, K. (2022). *Pengaruh el niño southern oscillation (enso) dan indian ocean dipole (iod) terhadap curah hujan dan korelasinya dengan consecutive dry days (cdd) provinsi sumatera selatan dari tahun 1981-2020*. Jurnal Ilmu Fisika dan Pembelajarannya (JIFP), 6(2), 31-41.

Ariska, M., Putriyani, F. S., Akhsan, H., Supari, S., Irfan, M., & Iskandar, I. (2023). Trend of rainfall pattern in palembang for 20 years and link to el-niño southern oscillation (enso). Jurnal Ilmiah Pendidikan Fisika Al-Biruni, 12(1), 67-75.

Diella, D., & Ardiansyah, R. (2019). *Pelatihan pengembangan lkpd berbasis keterampilan proses sains dan instrumen asesmen kps bagi guru ipa. Publikasi Pendidikan*, *9*(1), 7. https://doi.org/10.26858/publikan.v9i1.6855

Erlida Amnie, Abdurrahman, C. E. (n.d.). *Pengaruh keterampilan proses sains terhadap penguasaan konsep siswa pada ranah kognitif*. 123–137.

Erlida Amnie, Abdurrahman, C. E. (2014). *Pengaruh keterampilan proses sains terhadap penguasaan konsep siswa pada ranah kognitif. Jurnal Pembelajaran Fisika*, *2*(7), 123–137.

Hartono, H., Susanti, R., & Ariska, M. (2022). Science process skills analysis of junior high school students in south sumatera using test basic of process skill (baps). Jurnal Penelitian Pendidikan IPA, 8(5), 2184-2190.

Hartono, H., Putri, R. I. I., Inderawati, R., & Ariska, M. (2022). The strategy of science learning in curriculum 2013 to increase the value of science's Program for International Student Assessment (PISA). Jurnal Penelitian Pendidikan IPA, 8(1), 79-85.

Juhji, J. (2016). *Peningkatan keterampilan proses sains siswa melalui pendekatan inkuiri terbimbing*. *Jurnal Penelitian Dan Pembelajaran IPA*, *2*(1), 58. https://doi.org/10.30870/jppi.v2i1.419

Kartimi, Gloria, R. Y., & Ayani. (2013). *Penerapan pendekatan keterampilan proses dalam pengajaran biologi untuk mengetahui hasil belajar siswa pada pokok bahasan ekosistem kelas vii di smpn 1 talun*. *Jurnal Scientiae Educatia*, *2*(1), 73–85. http://www.syekhnurjati.ac.id/jurnal/index.php/sceducatia/article/view/524

Kastawaningtyas, A., & Martini, M. (2018). *Peningkatan keterampilan proses sains siswa melalui model experiential learning pada materi pencemaran lingkungan.*

*Jurnal Penelitian Pendidikan IPA*, *2*(2), 45. https://doi.org/10.26740/jppipa.v2n2.p45-52

Kurniawan, A. (2016). *Profil penguasaan keterampilan proses sains mahasiswa program pendidikan guru sekolah dasar universitas terbuka* science process skills mastery profile students primary school teacher education program open university. *Procceding Biology Education Conference* , *13*(1), 410–419.

Lestari, M. Y., & Diana, N. (2018). *Keterampilan proses sains ( kps ) pada pelaksanaan praktikum fisika dasar 1*. *Indonesian Journal of Science and Mathematics Education*, *01*(1), 49–54. https://ejournal.radenintan.ac.id/index.php/IJSME/index

Lutfa, Asna, Sugianto, S. (2014). *Penerapan model pembelajaran pbl (problem based learning) untuk menumbuhkan keterampilan proses sains pada siswa sma*. *Unnes Physics Education Journal*, *3*(2), 78–80.

Pambudi, Teo, O. P., & Widodo, W. (2013). *Gelombang, peningkatan keterampilan proses sains melalui pembelajaran inkuiri terbimbing pada materi getaran dan gelombang*. 27–31.

Puspita, Z., Juhanda, A., & Windyariani, S. (2021). *Pengaruh pendekatan inkuiri-kontekstual berbasis teknologi informasi terhadap keterampilan proses sains peserta didik sma pada konsep ekosistem. Biodik*, *7*(3), 176–184. https://doi.org/10.22437/bio.v7i3.13430

Putri, D. T., Setiono, S., & Ramdhan, B. (2021). *Profil keterampilan proses sains peserta didik menggunakan model pembelajaran 9e learning cyccle at home melalui pembelajaran daring. Biodik*, *7*(3), 164–175. https://doi.org/10.22437/bio.v7i3.13718

Rahayu, S., Ahied, M., Hadi, W. P., & Wulandari, A. Y. R. (2021). *Analisis keterampilan proses sains siswa smp pada materi getaran gelombang dan bunyi. Natural Science Education Research*, *4*(1), 28–34. https://doi.org/10.21107/nser.v4i1.8389

Rauf, R. A. A., Rasul, M. S., Mansor, A. N., Othman, Z., & Lyndon, N. (2013). Inculcation of science process skills in a science classroom. *Asian Social Science*, *9*(8), 47–57. https://doi.org/10.5539/ass.v9n8p47

S, Frafti Rejeki, Usman, A. A. (2020). *Analisis keterampilan proses sains pada pelaksanaan praktikum fisika di sman 9 makassar*. *02*, 86–91.

Samsudin, C. M. (2020). *Analisis keterampilan proses sains melalui pembelajaran berbasis praktikum mata pelajaran ipa pada peserta didik kelas viii di mts negeri 1 bandar lampung. Konstruksi Pemberitaan Stigma Anti-China Pada Kasus Covid-19 Di Kompas.Com*, *68*(1), 1–12. http://dx.doi.org/10.1016/j.ndteint.2014.07.001%0Ahttps://doi.org/10.1016/j.ndteint.2017.12.003%0Ahttp://dx.doi.org/10.1016/j.matdes.2017.02.024

Utami, D. S., Muharrami, L. K., Hadi, W. P., & Ahied, M. (2020). Profil scientific reasoning ability siswa pada materi gerak benda. *Quantum: Jurnal Inovasi Pendidikan Sains*, *11*(2), 93. https://doi.org/10.20527/quantum.v11i2.8570

Yuliati, Y. (2016a). *Peningkatan keterampilan proses sains siswa sekolah dasar melalui model pembelajaran berbasis masalah. Jurnal Cakrawala Pendas*, *2*(2). https://doi.org/10.31949/jcp.v2i2.335

Yuliati, Y. (2016b). *Penulis adalah dosen tetap prodi pgsd fakultas pendidikan dasar dan menengah universitas majalengka 71*. *Jurnal Cakrawala Pendas*, *2*(2), 71–83.

Kartimi, Gloria, R. Y., & Ayani. (2013). *Penerapan pendekatan keterampilan proses dalam pengajaran biologi untuk mengetahui hasil belajar siswa pada pokok bahasan ekosistem kelas vii di smpn 1 talun. Jurnal Scientiae Educatia*, *2*(1), 73–85. http://www.syekhnurjati.ac.id/jurnal/index.php/sceducatia/article/view/524

Kastawaningtyas, A., & Martini, M. (2018). *Peningkatan keterampilan proses sains siswa melalui model experiential learning pada materi pencemaran lingkungan. Jurnal Penelitian Pendidikan IPA*, *2*(2), 45. https://doi.org/10.26740/jppipa.v2n2.p45-52

Kurniawan, A. (2016). *Profil penguasaan keterampilan proses sains mahasiswa program pendidikan guru sekolah dasar universitas terbuka* [science process skills mastery profile students primary school teacher education program open university.] *Procceding Biology Education Conference* , *13*(1), 410–419.

Lestari, M. Y., & Diana, N. (2018). *Keterampilan proses sains ( kps ) pada pelaksanaan praktikum fisika dasar 1. Indonesian Journal of Science and Mathematics Education*, *01*(1), 49–54. https://ejournal.radenintan.ac.id/index.php/IJSME/index

Lutfa, Asna, Sugianto, S. (2014). *Penerapan model pembelajaran pbl (problem based learning) untuk menumbuhkan keterampilan proses sains pada siswa sma*. *Unnes Physics Education Journal*, *3*(2), 78–80.

Pambudi, Teo, O. P., & Widodo, W. (2013). *Gelombang, peningkatan keterampilan proses sains melalui pembelajaran inkuiri terbimbing pada materi getaran dan gelombang*. 27–31.

Puspita, Z., Juhanda, A., & Windyariani, S. (2021). *Pengaruh pendekatan inkuiri-kontekstual berbasis teknologi informasi terhadap keterampilan proses sains peserta didik sma pada konsep ekosistem. Biodik*, *7*(3), 176–184.

Putri, D. T., Setiono, S., & Ramdhan, B. (2021). *Profil keterampilan proses sains peserta didik menggunakan model pembelajaran 9e learning cyccle at home melalui pembelajaran daring. Biodik*, *7*(3), 164–175.

Rahayu, S., Ahied, M., Hadi, W. P., & Wulandari, A. Y. R. (2021). *Analisis keterampilan proses sains siswa smp pada materi getaran gelombang dan bunyi. Natural Science Education Research*, *4*(1), 28–34.

Rauf, R. A. A., Rasul, M. S., Mansor, A. N., Othman, Z., & Lyndon, N. (2013). Inculcation of science process skills in a science classroom. *Asian Social Science*, *9*(8), 47–57.

S, Frafti Rejeki, Usman, A. A. (2020). *Analisis keterampilan proses sains pada pelaksanaan praktikum fisika di sman 9 makassar*. *02*, 86–91.

Samsudin, C. M. (2020). *Analisis keterampilan proses sains melalui pembelajaran berbasis praktikum mata pelajaran ipa pada peserta didik kelas viii di mts negeri 1 bandar lampung. Konstruksi Pemberitaan Stigma Anti-China Pada Kasus Covid-19 Di Kompas.Com*, *68*(1), 1–12.

Utami, D. S., Muharrami, L. K., Hadi, W. P., & Ahied, M. (2020). Profil scientific reasoning ability siswa pada materi gerak benda. *Quantum: Jurnal Inovasi Pendidikan Sains*, *11*(2), 93.

Yuliati, Y. (2016a). *Peningkatan keterampilan proses sains siswa sekolah dasar melalui model pembelajaran berbasis masalah. Jurnal Cakrawala Pendas*, *2*(2).

Yuliati, Y. (2016b). *Penulis adalah dosen tetap prodi pgsd fakultas pendidikan dasar dan menengah universitas majalengka 71. Jurnal Cakrawala Pendas*, *2*(2), 71–83.