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Educational Research Association
The International Journal of
Educational Researchers 2019,
10(2): 48-56
ISSN: 1308-9501

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# Development of Ipa Student Activities Sheets (Lks) Based on Process Skills to Increase Learning Outcomes in Electrical Materials in Fifth Grade of Elementary School

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**Abstract**

This study aims to determine the feasibility of worksheets developed based on aspects of validity, practicality, and effectiveness. The research method is the development of 4-D. It consists of four stages, namely defining, designing, developing, and distributing. This research arrived at the development stage only. The results showed that the LKS based on process skills was deemed feasible from the aspects of validity, practicality, and effectiveness in limited trials. The validity of LKS is 88% with a very decent interpretation. The practicality of the process skills activity obtained an implementation of 84.72% with a very decent interpretation. The effectiveness of student learning outcomes obtained the completeness of the affective, cognitive, and psychomotor domains each by 89.29%; 85.71%, and 91.11%. The sensitivity index obtained a value of 0.53 with effective interpretation, and the significance test obtained results (t) = 8.7, so the difference in learning using LKS based on process skills was very significant.

**Keywords**: Student Activity Sheets (LKS), Process Skills, Learning Outcomes

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## Introduction

One of the basic knowledge taught in elementary school is Natural Sciences. Natural Sciences (IPA) or literally can be referred to as the science of nature and its contents, events and things that cause it. According to Putra (2013: 53), elementary science learning is the process of transferring two-way knowledge between teachers and students with certain methods. According to Asy'ari (2006: 37), elementary science learning departs from the level of thinking ability and characteristics of students. Science learning is learning that not only provides theory and concepts, but is more emphasized in the learning process that is associated with natural phenomena that occur in everyday life. In the competency standard graduates of natural science subjects in elementary school require students to observe natural phenomena, both about humans, animals, natural objects, and energy, then convey their observations verbally and in writing. Thus Natural Sciences in elementary schools requires students to use all of their sensory abilities to gain knowledge. Based on observations that have been carried out, precisely at the Dukuhtunggal Lamongan State Elementary School. There are several problems as follows: 1) as many as 68% of students who do not complete learning with KKM 75, 2) teacher-centered learning, 3) learning resources using LKS from publishers that do not fit the indicators that should be developed by teachers, 4) Books LKS only provides cognitive aspects, while affective and psycho-motoric aspects are neglected. Though students in learning must cover all three domains so that learning runs optimally, 5) students do not gain direct experience in obtaining the skills learned. LKS used by the teacher shows the LKS cover is very interesting with colored images, but the contents of the LKS use opaque colored paper with black and white prints. LKS is not equipped with activities that encourage students to be active in learning and actively discover the science concept according to its nature. LKS contains a summary of the concepts taught and then continues with practice questions. Summary and questions contain material that exceeds the KD you want to achieve. LKS has been distinguished between group and individual tasks, but still the same activities, namely answering questions, not by discussing activities in accordance with scientific steps and pleasant activities. So that both group and individual questions are often carried out by answering both of them individually. Students rarely study in groups. According to Widjajanti (2008: 2) LKS that are arranged appropriately, can be used to develop process skills.

Based on the above problems, it is necessary to improve the Student Activity Sheet based on process skills. LKS is actually a series of activities that are a guide for students to take part in ongoing learning. LKS functions as teaching material that makes it easier for students to understand the material being studied. Science process skills are all scientific skills used to find concepts or principles or theories in order to develop existing concepts or deny previous findings, Toharudin et al (2013: 35). Process skills equip students to observe, classify, predict, measure, infer, and communicate. This process skill is needed to obtain, develop, and apply concepts, legal principles and scientific theory. Through activities in the LKS, students will gain a deeper understanding of the surrounding environment, because students process in their learning. All process skills carried out by students will be useful in their daily lives. A sheet of process activities based on student skills will cover all three dimensions in natural science. Students learn by applying problem-solving procedures through scientific methods that include the preparation of hypotheses, experimental design or experiments, evaluation, measurement, drawing conclusions, and communicating. Through the activities that have been carried out students can increase curiosity about objects, natural phenomena, living things, causal relationships of a problem, and can solve these problems through the correct procedure. Because students process in their learning, experience directly, and students gain their knowledge through meaningful learning, in the end their understanding is deeper and the knowledge gained will last long in students.

Natural science or science can literally be called the science of nature, studying the events that occur in it (Julianto et al., 2011: 2). In the Big Indonesian Dictionary, science is interpreted as a science that can be tested or verified or based on reality. In addition, according to Benjamin (in Toharudin et al., 2011: 27), states that science is a way of investigation that strives to get data to information about our world (universe) by using observational methods and hypotheses that have been tested based on that observation. Science is scientific knowledge that is knowledge that has undergone the testing of its truth through the scientific method. Science is also a human effort that is systematic, organized, and

structured as a creative process driven by curiosity, determination, and perseverance. From these efforts, an explanation of the secrets of nature was revealed in the form of a collection of facts, definitions, concepts, principles, and scientific theories. Then in the Ministry of National Education (2006) the Natural Sciences understanding is developed into a science that finds out about nature systematically, so that science is not only mastery of a collection of knowledge in the form of facts, concepts, or principles, but also a process of discovery. Natural Sciences has several characteristics including 1) has scientific value, 2) is a series of interrelated concepts, 3) is a collection of systematically arranged knowledge, 4) is theoretical knowledge, and 5) Science includes four elements, namely process , products, applications, and attitudes. Science also has three dimensions namely product, process and attitude. Product dimensions, IPA is the result of research by previous researchers, in process simulations, IPA is obtained through a series of scientific procedures so that the results can be verified, while in the attitude dimension, IPA produces views on the universe and on humans themselves. To test quality science learning in accordance with the nature of Natural Sciences itself requires resources and learning activities that can drive student activities and provide motivation for students to learn so that they can improve their learning outcomes.

One rich and effective learning resource is to use Student Activity Sheets (LKS). Abdul Majid in his book Learning Planning (2011: 176) suggests that Student work sheets are sheets containing tasks that must be done by students. LKS is a printed teaching material in the form of sheets of paper containing material, summaries and instructions for the implementation of learning tasks that must be done by students, which refers to the basic competencies that must be achieved. Through LKS, students get structured directions regarding steps that must be taken in order to find the concept being studied. And to improve and introduce students to the scientific method, worksheets are made that are tailored to process skills. Samatowa (2011: 93) suggests that science process skills are intellectual skills possessed and used by scientists in researching natural phenomena. Whereas in the book Building Science Literacy Learners, Toharudin et al. (2011: 35) define science process skills are all scientific process skills used to find concepts or principles or theories in order to develop existing concepts or deny previous findings. Thus it can be concluded that process skills are scientific skills that students must possess in finding a concept or principle through research activities on natural phenomena. Another opinion by Amalia et al. (2009: 4) explains that process skills is one approach, in addition to approaches that emphasize facts and conceptual approaches, which are used in science learning which are based on the steps of activities in testing things that are usually done by scientists when building or proving a theory. Then more clearly Funk et al. (in Amalia 2009, 2.13) explains that the process skills approach is a way of teaching Natural Sciences with various process skills commonly used by scientists in obtaining or formulating science results. This approach involves students more with concrete material and scientific work.

According to Funk (in Toharudin et al., 2011: 36), it emphasizes that there are two things related to process skills, namely basic process skills and integrated process skills. The basic process skills are the parts that form the basis of scientific methods. There are six basic process skills, namely observing, communicating, classifying, measuring, inferring, and forecasting. Whereas integrated skills are a combination of two or more basic process skills. Integrated skills consist of several things, namely identification of variables, identification of tabulations, identification of graphs, description of variable relationships, acquisition and processing of data, analysis of investigations, formulating hypotheses, and skills in conducting experiments to prove a theory or explanation based on observation and reasoning.

The process skills developed in this development research are the skills of observing, interpreting data or analyzing it by relating it to real situations and experiences of students, making conclusions, and communicating the results of observations that have been done both in written and oral forms. Learning to use LKS based on skill processes is expected to improve learning outcomes. According to Nana Sudjana, (2014: 22), suggests that learning outcomes are abilities possessed by students after experiencing learning. Whereas according to Susanto, (2013: 5), the meaning of learning outcomes are changes that occur in students, both involving cognitive, affective, and psychomotor aspects as a result of learning activities. Based on the background based on the background that has been described, it is necessary to follow through a study entitled "Development of Student Activity Sheets (LKS) IPA-

Based Process Skills to Improve Learning Outcomes in Class V Electrical Material in Primary Schools". This study aims to 1) Know the Feasibility of Student Worksheets based on process skills developed to improve the learning outcomes of Natural Sciences in fifth grade students of SDN Dukuhtunggal Lamongan, 2) Know the validity of Student Worksheets based on process skills developed to improve student learning outcomes class V SDN Dukuhtunggal Lamongan, 3) Knowing the activities of students' process skills during learning by using process skills-based LKS to improve learning outcomes of Natural Sciences fifth grade students of SDN Dukuhtunggal Lamongan, 4) Knowing student learning outcomes in learning using process sheets based on student skills on natural science subjects that can be analyzed from the results of learning.

The meaning of the learning outcomes above, can be concluded that learning outcomes are abilities obtained by students after carrying out learning activities which include cognitive, affective, and psychomotor aspects.

## Method

The design of this study is included in research and development (R & D). Four-D development model. This model consists of four stages of development, namely defining, designing, developing and disseminating. But researchers carry out research until the development stage, without dissemination. This is tailored to the needs of the study. At the define stage, the researcher analyzes the conditions in the field. The researcher identifies the KD and indicators and determines the main material to be taught, collects and selects relevant material and rearranges it systematically. The next step is the formulation of goals and indicators for achieving goals by developing existing basic competencies. The design (*Design*) of the first stage is the preparation of the test. Tests are prepared based on the formulation of objectives and indicators that have been set. The results of the initial design are LKS based on process skills. Development (*Develop*) phase is carried out by examining the content and readability of LKS based on process skills to experts or material experts in the field of science.

The researcher then corrects the worksheet from the material expert. The next stage is the validation test, the product design validation stage is done to assess the validity of the LKS product design that has been made. The LKS results of the validation are then revised according to suggestions and criticisms from the validator, so that the LKS really meets the needs of students. Improved worksheets were then tested to a limited group twice, namely a small group test of 10 students, and a limited test for 1 class of students. The product testing phase is carried out to test the feasibility level of worksheets developed based on the criteria for content, presentation, language and science process skills. This stage is carried out after the validation and revision stages. This worksheet was tested in the form of draft III worksheets which were tested on fifth grade students of SDN Dukuhtunggal Lamongan, which numbered 10 heterogeneous students (based on sex and learning outcomes), then tested again in a limited group of students in class V, namely 28 students. To find out the effectiveness of the LKS in improving students' understanding of natural science, the activity was continued by giving practice questions with the material in accordance with the developed worksheet. Trials in this development were carried out on limited groups. The trial design uses experimental design. Using the design of the type of one group pretest-posttest design. The test subjects in this study were fifth grade students of SDN Dukuhtunggal Lamongan. The trial was conducted in a small group of 10 heterogeneous children (gender and learning outcomes). Then tested the second time in a limited group, namely the whole class V students of SDN Dukuhtunggal Lamongan which amounted to 28 students.

## Result

The results of the study "Development of Student Activity Sheets (LKS) IPA-Based Process Skills to Improve Learning Outcomes in Class V Electrical Material in Primary Schools" on electrical material. The results of the trial obtained positive results, it was proven that student learning outcomes increased after learning using LKS-based material material process skills. The full results of the research are as follows:

If the results of the three validators are averaged, the highest percentage of eligibility percentage is in the content criteria with an average percentage reaching 90%. While the criteria that get the lowest percentage on the conformity criteria with process skills with an average percentage of 84.76%. The

feasibility of presentation and linguistic criteria obtained an average percentage of almost the same namely 88.89% and 88%. Thus LKS based on material process skills can be declared valid with the overall average percentage reaching 88% with a very decent interpretation. This shows that the LKS based on process skills developed has been in accordance with the criteria for the preparation of good LKS, namely: 1) on the content criteria, there is an identity which includes the title, objectives, instructions for working on the LKS, and bibliography, 2) on presentation criteria, which includes how to present LKS, suitability of material, arrangement of interesting LKS accompanied by pictures, 3) linguistic criteria which include clarity, conformity with EYD, and communicative, 4) conformity with basic process skills. This is in accordance with what was stated by BNSP (2008), that LKS must meet the material criteria or content, presentation, and language. In connection with this, the LKS developed is able to guide students in discovering the concept of science in science subjects in electrical matter.

Student Process Skill Activity The highest LKS implementation value is owned by LKS 1, with implementation percentage of 85.77%, while the implementation of the smallest LKS is on LKS 3, with the implementation value of 82.95%. Dissolving skills get the highest percentage, this shows that students have been able to provide decisions based on facts and knowledge gained through activities on the developed worksheets. In accordance with what was stated by Toharudin et al. (2011: 37) that inference or concluding is a skill to decide the state of an object or event based on known facts, concepts, and principles. The lowest percentage of communication skills, this shows that students need more intensive training to gain skills in communicating ideas and thoughts. According to Funk in Toharudin (2011: 36), communicating something obtained can be done orally or in writing. Scientific communication is usually done in writing as a report on observations or experiments. Students have carried out activities in communicating in writing through LKS. But the need for oral communication to train students' courage and confidence in expressing ideas. Because the authors believe that by improving the communication skills of students, students are able to increase their confidence in their abilities so that they can increase their motivation and learning outcomes.

Student observation skills are classified as good in students' process skills activities, this shows that students are able to carry out and design activities in accordance with the steps in the LKS, and observe each outcome of the activities carried out carefully. In accordance with what was stated by Semiawan (2008: 68) that to observe the necessary precision and accuracy in identifying the specific character of the object and the symptoms observed by using all five senses possessed. While the skills of interpreting students are good with the presentations obtained, this shows that through activities in the LKS developed by answering the analysis questions, students are able to interpret and understand the data in the table that has been obtained through observation and linking it with the concepts and principles it understands. Overall, the four process skills obtained an implementation percentage above 61%, then the LKS based on process skills developed could be said to be feasible in terms of effectiveness. Thus LKS can be used as a learning resource that provides hands-on experience to students in obtaining concepts as has been done by scientists when trying to break down the mysteries of nature, so that students will be expected to have a high curiosity attitude and produce new discoveries that are useful to society. As stated by Toharudin (2011: 36), process skills can be a driving force for discovery, development of facts and concepts, and the development of attitudes, insights, and values.

Student Learning Outcomes in the affective domain of attitudes developed in this time learning are honest, responsible, working together, asking questions, arguing and respecting others. Students are said to be complete if they get a value of $\geq 75$. The completeness of students is 89.29%. the average value of students shows an increase from the first meeting to the second meeting. The highest affective value in honest character is followed by the character of respecting others. The character of cooperation and responsibility has increased quite high. Then the character asks and argues the lowest. This shows that student learning using LKS based on electrical material process skills can improve honesty, responsibility, asking questions, and arguing, and respecting others through the activities that have been carried out during the learning process. Cooperation, opinion, and asking are the initial processes in improving higher mental functions so that students can internalize these values to be a good lifestyle. This is consistent with what is believed by Vygotsky in Trianto (2011: 27) that higher mental functions generally appear in conversations and cooperation between individuals before higher

mental functions are absorbed into the individual. Increasing the affective value of students shows an increase in students' interest in learning so students can achieve completeness and success in learning that can be seen in cognitive learning outcomes. In accordance with what was stated by Pophan in Haryati (2007: 36), said that the affective domain determines the success of one's learning. But the combination of the three domains of learning outcomes if managed properly in learning is certainly faster in improving learning outcomes. Therefore, the three domains of learning outcomes must be considered carefully by the teacher.

In the cognitive domains Learning outcomes are measured using written test instruments given before carrying out learning trials using LKS-based process skills developed (*Pre-test*) and after learning trials using process skills-based LKS (*Post-test*). Classically, there was an increase from the test before the trial using the skill-based LKS process and after the trial with KKM as much as 75. The completeness presentation before carrying out learning with LKS based on process skills reached 35.71%, with 9 students completing and 19 others not complete. While the presentation of completeness after implementing learning with process skills-based LKS reached 85, 71%, with 24 students completing and 4 students not completing. Thus it can be concluded that student learning outcomes after using the LKS-based electrical material process skills are completed in a classical manner. This shows that learning using LKS based on process skills developed effectively improves student learning outcomes. Students who have not experienced learning in accordance with process skills have increased values related to the question of process skills. Students begin to recognize hypotheses, formulate problems, analyze data, and conclude, and how to carry out observing and conducting experiments.

In the Psychomotor realm, psychomotor learning outcomes are obtained through observations during learning trials using LKS based on process skills. Process skills are assessed in one group including skills in making observations and experiments, skills in designing and using tools and materials in accordance with the instructions in the LKS, as well as skills in writing complete results of activity data. This is in accordance with what was stated by Mager in Haryati (2007: 25) that subjects included in the group of psychomotor subjects are subjects that include physical movements and hand skills. The results of students' psychomotor values can be seen that the average overall psychomotor value is 88, 07. Thus overall, student activities during learning using the LKS-based Skills Process are very good. If averaged, the value of group activity increased from the first meeting to the second meeting, which was from 85.02%, increasing to 91.11%. This shows that there is a shift in activity or activity of students in a positive direction in accordance with the learning objectives. This is in accordance with what was stated by Harjanto (2006: 92), the educational goals of the psychomotor domain are learning outcomes / goals related to skills or motor skills.

The three domains of student learning outcomes have increased after the trial using LKS based on electrical material process skills. This shows that learning carried out rich in activities, especially process skills in Natural Sciences subjects can improve learning outcomes. Because the main character of Natural Science is the existence of activities that take place specifically to be able to understand the universe and the phenomena that occur. Essential material taught and packaged in worksheets through interesting activities is the result of research by scientists when observing natural phenomena. The material is well studied by students using a method that is designed to resemble how scientists first obtained it. This will not be realized if it is not accompanied by curiosity and enthusiasm from students, as well as the attitude of students to the knowledge they learn also to social (students with other students). Based on the results of this study it can be seen that studying Natural Sciences aims in accordance with the nature of science itself as a process, product, and attitude. This is appropriate based on a study of the background contained in the elementary and MI science content standards.

Learning Effectiveness Using Skills-Based LKS Process Material can be identified from the results of the Sensitivity Index about evaluation

Sensitivity Index of Question Evaluation

| Question Number | RA | RB | Is | Question Number | RA | RB | Is |
|---|---|---|---|---|---|---|---|
| 1 | 27 | 15 | 0,43 | 14 | 24 | 4 | 0,71 |
| 2 | 27 | 13 | 0,50 | 15 | 26 | 14 | 0,43 |
| 3 | 25 | 16 | 0,32 | 16 | 24 | 8 | 0,57 |
| 4 | 25 | 9 | 0,57 | 17 | 23 | 12 | 0,39 |
| 5 | 26 | 13 | 0,46 | 18 | 28 | 13 | 0,54 |
| 6 | 25 | 11 | 0,50 | 19 | 25 | 7 | 0,64 |
| 7 | 24 | 11 | 0,46 | 20 | 26 | 12 | 0,50 |
| 8 | 26 | 7 | 0,68 | 1 | 27 | 7 | 0,71 |
| 9 | 25 | 10 | 0,54 | 2 | 25 | 4 | 0,75 |
| 10 | 27 | 10 | 0,61 | 3 | 19 | 7 | 0,43 |
| 11 | 23 | 15 | 0,29 | 4 | 20 | 4 | 0,57 |
| 12 | 19 | 8 | 0,39 | 5 | 25 | 8 | 0,61 |
| 13 | 27 | 8 | 0,68 | Average of Is = 0,53 (Effective) | | | |

It can be seen that the sensitivity index of the whole question is positive. The average sensitivity index of all the questions tested to students is above 0.51 which is 0.53 with effective interpretation. This shows that learning carried out by researchers using LKS based on material process skills in electricity is included in the category of effectively improving student learning outcomes. Thus it can be concluded that learning using LKS based on material process skills in electricity has been feasible in terms of effectiveness.

Significance Tests, student scores between pre-test and tests can be tested for significance with the following calculations:

Effectiveness of Treatment (t) = $\frac{Md}{\sqrt{\frac{\sum x^2 d}{N(N-1)}}}$

$= \frac{13,82}{\sqrt{\frac{1888,107}{28\times27}}}$

$= \frac{13,82}{\sqrt{\frac{1888,107}{756}}}$

$= \frac{13,82}{\sqrt{2,4975}}$

$= \frac{13,82}{1,58}$

$= 8,746$

With (t) tables at the significance level of 5% = 2.05, and at the significance level of 1% = 2.77. Based on the calculation, obtained (t) count> (t) table, the difference between the results of the pre-test and post-test is very significant. Thus, based on the calculation of the significance test, it can be concluded that learning using LKS based on process skills in electrical material is feasible in terms of effectiveness. Thus the development of process skills-based LKS to improve science learning outcomes of fifth grade students of SDN Dukuhtunggal Lamongan has been successful with the fulfillment of eligibility requirements on aspects of feasibility, practicality, and effectiveness. This is in accordance with the previous research, namely by Sri Pujiarsih (2015) who developed LKS to practice the process skills of students obtaining success based on the validity aspect of 91.8% with very decent interpretation, aspects of practicality in terms of observing student activities with an average of 93, 6 with very feasible interpretation, and effectiveness aspects reviewed from the results of the 0% pre-test, and post-test at 80% with a proper interpretation. The learning process of science process is 85.6% with very decent interpretation, and student responses are 95% with very decent interpretations.

## Discussion

LKS was developed in accordance with development research procedures from Sugiyono (2011: 409), namely: analyzing potential and problems, data collection, product design, design validation, design revision, product testing, product revision, usage testing, and product revision. At the stage of analyzing potential and problems is done by analyzing the needs in terms of teachers, students and curriculum and formulating the problem of the need to develop science-based worksheets based on process skills in electrical material, at the stage of data collection is done by finding references related to electrical material and guidelines in development LKS and process skills approach, the product design stage is done by designing and compiling science skills worksheets based on process skills, at the design validation stage is done by validating the LKS on expert experts, namely material experts, media and learning, at the design revision stage by revising the LKS already assessed by expert experts, the product testing phase was carried out by testing the LKS in small groups of 10 students, at the product revision stage by revising the LKS after testing the small group products, using the trial test using the method LKS trials in large groups of 28 students and the final product revision stage were carried out by revising the LKS after the usage test to obtain the final product ready for use.

The feasibility of LKS is tested by using the same standards as the standard teaching materials from BSNP (2007: 21-22), namely the feasibility of the material including content and language. Feasibility of LKS other than material feasibility, media, learning. LKS based on material process skills can be declared valid with an overall percentage of 88% with a very decent interpretation. Student Process Skills the highest LKS implementation value is owned by LKS 1, with the implementation percentage of 85.77%, while the smallest LKS is implemented on LKS 3, with the implementation value of 82.95%. Overall, the four process skills obtained an implementation percentage above 61%, then the LKS based on process skills developed could be said to be feasible in terms of effectiveness. Student Learning Outcomes in the affective domain of attitudes developed in this time learning are honest, responsible, working together, asking questions, arguing and respecting others. Students are said to be complete if they get a value of ≥ 75. The completeness of students is 89.29%. Classically, there was an increase from the test before the trial using the skill-based LKS process and after the trial with KKM as much as 75. The completeness presentation before carrying out learning with LKS based on process skills reached 35.71%, with 9 students completing and 19 others not complete. While the presentation of completeness after implementing learning with process skills-based LKS reached 85, 71%, with 24 students completing and 4 students not completing. students' psychomotor value can be seen that the average overall psychomotor value is 88.07. Thus overall, student activities during learning using the LKS-based Skills Process are very good. If averaged, the value of group activity increased from the first meeting to the second meeting, which was from 85.02%, increasing to 91.11%. With (t) tables at the significance level of 5% = 2.05, and at the significance level of 1% = 2.77. Based on the calculation, obtained (t) count> (t) table, the difference between the results of the pre-test and post-test is very significant. Thus, based on the calculation of the significance test, it can be concluded that learning using LKS based on process skills in electrical material is feasible in terms of effectiveness.

## Conclusion

The results showed that student learning outcomes during learning using LKS based on material process skills in the cognitive realm increased based on students' completeness scores. While the affective and psychomotor domains of learning outcomes also increase from the first meeting to the second meeting according to the percentage of the total average. Through the calculation of the sensitivity index the questions tested, obtain a positive value. And the calculation of the significance test results of the pre-test and post-test scores can be stated to be very significant. Student Activity Sheets based on process skills are feasible based on the validity aspects of the results of validation by three experts, practical aspects of the results of observations of student process skills activities, and effectiveness of student learning outcomes. Activity Sheets Students based on process skills on electricity are declared valid based on the assessment given by three validators with a total percentage of 88% with a very decent interpretation. The activities of students' process skills that are developed include observing, interpreting, concluding, and communicating can be expressed very well in accordance with the percentage of implementation by students.

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