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Description of Science Process Skills' Physics Education Students at Jambi University in Temperature and Heat Materials

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Abstract

This study aims to determine the skills of science process students have previously done in physics education courses. Science process skills focused on this research are basic process skills that include observation, communication, and classification as well as the skills of the integration process that include the skills of variable identification, graphics skill, and skills to acquire and process data. This research uses total sampling. The quantitative data collected through the observation sheet was analyzed using de-scriptive. The results of this study, physics students are still many who are not skilled in doing their own lab work so that the science physics process is still low. Obstacles encountered during the implementation of Basic Physics II is the lack of knowledge of students about the tools and materials in the laboratory, students have not been able to perform independent lab, and students have not been able to communicate their findings at the time of the lab. Some obstacles that hamper to do the lab course inhibits the science process skills of Physics Education students of Jambi University. These results provide information that the magnitude of science process skills possessed by physics education students Jambi University can be useful for other courses.

Keywords

Science Process Skills, Physics Education

1. Introduction

Education plays an active role in improving the quality and quantity of human resources. republic of Indonesia law number 20 in 2003 about the education system, where the purpose of the education system is to build qualified and independent human beings whose values are based on Pancasila. One of the educational providers which are the basis for determining the quality of education is the college. Colleges may consist of several faculties, one of which is the teacher's faculty and the education sciences. The physics education study program is one of the study programs which is available in a faculty of teacher and education which has the aim to produce skilled graduates in various aspects of competence such as knowledge, understanding, and skill.

Shahali and Halim (2010) physics education aims to develop students' skills in investigations supported by scientific knowledge and student abilities from a scientific approach. The most important competence that physics education students should have is skill competence. By having skills supported by scientific knowledge and students' abilities of a scientific approach, physics students can develop an understanding of scientific concepts. The skills needed to develop such scientific con-

cepts are process skills. Science process skills are needed to show how to acquire a scientific concept (Rauf, 2013).

Ozgelen (2012) Science process skills are skills for acquiring knowledge, solving problems and communicating the results obtained This means that process skills comprise the ability to process scientific thinking and the ability to process actions in order to develop an understanding of scientific concepts. The development of such scientific concepts will support subsequent capabilities such as creativity, critical thinking skills, and greater accuracy or abilities, where such abilities are often used in everyday life. Aktamis dan Ergin (2008) Science process skills that can be used by every individual in everyday life by understanding the nature of science in order to improve the quality of life. Science process skills consist of basic process skills and integrated process skills. Turiman et al, (2012) science process skills are divided into two parts: basic process skills and inte-grated process skills.

Basic process skills include observing, classifying, communicating, measuring, summing up, predicting. Chabalengula et al, (2012) observing, summarizing, measuring, communicating, classifying, predicting, using time-space relationships and using numbers are part of basic process skills. Basic process skills are very important to be mastered by physics students in conducting experiments. Rezba (1995) basic science process skills are all actions one performs while experimenting. Because all experimental activities stem from observation, where observation is part of basic process skills. Monhardt, L. and Monhardt, R. (2006) Observing skills are the most basic of the students when conducting an experiment.

Students who do not have observation skills, then the student is unable to obtain information and find the problem to be solved and this will affect other skills. The ability of observation can develop skills such as concluding skills, communications, predictions measuring and drawing conclusions (Rezba, 1995). Skills influenced by not having observation skills are lacking classification skills because they lack the data to be grouped, lack of communication skills because they do not obtain data or information to be conveyed cannot predict, measure or even draw conclusions. So it can be said that if a physics student does not have basic process skills then cannot master the skills of the integrated process.

Turiman et al, (2012) basic science process skills are skills that must be mastered first before mastering the skills of integrated science processes. Identify variables, build data tables, graphs, describe relationships among variables, acquire and process your own data, analyze investigations, build hypotheses, define variations operationally, design inquiry, and experiment. This skill arises by using the method used, which means while learning, which will result in a higher ability in students, that is, students can group data in the table while making a graph of the data obtained. Technical Operations for review Viewing skills Basic and integrated basic processes Students can observe From practical activities because the hearts of practical activities can bring up the skills of science processes that are owned or not owned by students. Rauf et al, (2013) Basic science process skills assist students in developing learning through hands-on experience. If physics students will not finish learning and it will be very difficult for students to develop higher abilities and this will decay on students later on become a teacher. Mutlu and Temiz (2013) that integrated process skills are an indispensable skill for solving problems or conducting experimental activities.

In the education of a teacher is the main foundation for building human knowledge, knowledge of the students. Republic of Indonesia law number 14 in 2005 about teachers and lecturers, where teachers are professional educators who have the task of guiding, training and building knowledge of learners. In building learners' knowledge, a teacher or physics teacher must have process skills in teaching physics. Settlage and Southerland (2007) A physics teacher must understand the underlying meaning of process skills and can demonstrate competence in process skills that can provide meaningful learning to learners. It is based on physics learning which emphasizes more on the formation of skills which then communicates the results of the knowledge gained. Chabalengula (2012) a teacher must have understanding good concepts and powerful science process skills if they have to teach effectively in their classes. Miles (2010), a teacher is required to teach the science process skills. In addition, the science process skills have competencies that can be used as a means to gain knowledge and understand how the knowledge ob-

tained. (Bati et al, 2010). A physics teacher or physics teacher candidate who does not have process skills then when the learning takes place the teacher can only explain the theory with monotonous teaching methods such as lecture methods and not with a scientific approach. This will have an impact on students who have no skills in experimenting because they are taught only about theory. An important task of science educators is to help students develop the thinking skills of scientists (Roth, 1993). In addition, the learning that takes place will feel boring for learners, because of the inability to imagine an event in science with concrete and true.

Physics education study program has a goal to produce graduates who are skilled in various aspects of competence, especially skill competence. This research is conducted to know the basic process skill of physics education student on temperature and heat material. The questions addressed in this study are as follows:

1. How is the description of basic process skill of physics education student of Jambi University?
2. How is the description of integrated process skill on physics education student of Jambi University?
3. What are the constraints faced when the implementation of the basic physics practical manual 2 is implemented?
4. What is the solution to the constraints faced?

2. Methods

2.1. Research Design

This research uses quantitative research type. Quantitative data, such as scores on the instrument, produce specific numbers that can be statistically analyzed and can provide useful information if you need to describe a problem (Cresswell & Plano Clark, 2017). The type of quantitative research used in this study is true-experiment type control group post-test only, Cohen (2002) a true experimental design is usually chosen for use in educational experiments.

2.2. Research Sample

The sample was taken from 91 people total students who contracted the basic physics II period 2017/2018 at even semester, consisting of 78 women and 13 men. This research used the sampling technique that is the total sampling for the quantitative data from the observation sheet, this is in accordance with the purpose of research that is to describe the science process skills on physics education student of Jambi University.

3. Research Instruments

The instruments used in this research are observation sheet and interview. The observation sheet is used to measure students' science process skills. In the evaluation sheet using Likert Scale, Likert Scale is used to measure students' science process skills during the lab with a four-choice model (four scales) with the category 1 = VERY NOT GOOD, 2 = NOT GOOD, 3 = GOOD, and 4 = VERY GOOD. Science process skills in the observation is divided into two categories namely basic science process skills and integrated science process skills. The basic process skill observed is divided into three namely observation, communication, and classification of 4 activities in chapter temperature and heat with a total of 50 points statement. The integrated process skill that is observed is divided into three, namely the identification of variables, graphs, and the acquisition and processing of 4 activities in the temperature and heat chapter with a total of 28 point statements. As for the lattice and rubric of the observation, a sheet is listed in Table 1.

For interviews, it was conducted on 17 students to strengthen the data obtained from the observation sheet and related to the application of science process skills. Guidance on conducting interviews based on indicators on the observation sheet.

Table 1. Gridobservation sheet science process skills in basic physics practice 2 temperature and heat material.

Science Process Skills	Indicator	Number Item 1 (Change Activity)	Number Item 2 (Heat of metal activities)	Number Item 3 (Heat of fluid types)	Number Item 4 (Ice melting activities)
Basic process skills	a. Observing	1, 2, 3, 4, 5, 6 9	1,2,3,4,5,6,7,8,9	5,7,8,9,10,11	5, 6, 7, 8, 9
	b. Communicating	7,8	12		
	c. Classifying				
Integrated process skills	a. Identify variables	19, 20,21	24		
	b. Graphs	26			
	c. Acquire and process your own data	29, 30, 31	34		

3.1. Data Analysis

The quantitative data collected through the observation sheet was analyzed using descriptive statistics. Descriptive statistics display the general trend in the data to describe one of the variables (Cresswell, 2012) used to describe the science physics student process science skills.

4. Results and Discussion

4.1. Results

Table 2. Science process skills on change activity.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	4	4.39
		NOT GOOD	22	24.17
		GOOD	28	30.76
		VERY GOOD	37	40.65
	COMMUNICATING	VERY NOT GOOD	11	12.08
		NOT GOOD	41	45.05
		GOOD	16	17.58
		VERY GOOD	23	25.27
	CLASSIFYING	VERY NOT GOOD	0	00.00
		NOT GOOD	14	15.38
		GOOD	31	34.06
		VERY GOOD	46	50.54
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	6	6.59
		NOT GOOD	22	24.17
		GOOD	35	38.46
		VERY GOOD	28	30.76
	GRAPHS	VERY NOT	7	7.69

		GOOD		
		NOT GOOD	9	9.89
		GOOD	18	19.78
		VERY GOOD	57	62.63
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	2	2.19
		NOT GOOD	7	7.69
		GOOD	18	19.78
		VERY GOOD	64	70.32

Basic Physics Practical Guidebook 2 on Temperature and heat materials consists of 4 activities, namely changes in form, metal heat, liquid type heat and ice melting heat. The sample used in the implementation of the manual is 91 students. The process skills that are focused in this research are basic process skill which includes observation, communication, and classification as well as the skill of the integration process which includes variable identification skill, graphic skill, and skill of obtaining and processing data. The result of observation of science process skill in physics education student of Jambi University in each activity is shown in Table 2.

Table 2 shows the percentage of observations for the science process skills of 91 students found that the observation skills have a percentage of 40.65% belonging to the good category. For communication skills have a percentage of 45.05% and included in the category is not good. The classification skills have the percentage of 50.54% included in the category is very good. The skills of identifying the variables have a percentage of 38.46% which fall into either category. The skill of the process of making the graph has a percentage of 62.63% which fall into very good category. As well as the skills to obtain and processing the data as a percentage of 70.32% and included in the category very well. Furthermore, in Table 3 will display data science process skills on the heat of metal activities.

Table 3 shows the percentage of observations for the science process skills of 91 students found that the observation skill has a percentage of 56.04% which belongs to the good category. For the communication skills included in the bad and good category where each category has the same percentage that is 28. 57%. For classification skills as a percentage of 39.56% included in the category is very good. For the skills of identifying the variables have a percentage of 42.85% which fall into the category very well. And for the process skill to make the graph has a percentage of 40.65 % that fall into the category is not very good. As well as on the skills of obtaining and processing data has a percentage of 34.06% and included in the category very well. Furthermore, Table 4 will display data science process skills on the activity of the liquid type of heat.

Table 3. Science process skills on the heat of metal activities.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	3	3.29
		NOT GOOD	22	24.17
		GOOD	51	56.04
		VERY GOOD	15	16.48
	COMMUNICATING	VERY NOT GOOD	26	28.57
		NOT GOOD	24	26.37
		GOOD	26	28.57
		VERY GOOD	15	16.48
	CLASSIFYING	VERY NOT GOOD	12	13.18

		NOT GOOD	18	19.78
		GOOD	25	27.47
		VERY GOOD	36	39.56
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	1	1.09
		NOT GOOD	26	28.57
		GOOD	25	27.47
		VERY GOOD	39	42.85
	GRAPHS	VERY NOT GOOD	37	40.65
		NOT GOOD	10	10.98
		GOOD	19	20.87
		VERY GOOD	25	27.47
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	12	13.18
		NOT GOOD	18	19.78
		GOOD	30	32.96
		VERY GOOD	31	34.06

Table 4. Science process skills on the heat of fluid types.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	0	00.00
		NOT GOOD	14	15.38
		GOOD	54	59.34
		VERY GOOD	23	25.27
	COMMUNICATING	VERY NOT GOOD	17	18.68
		NOT GOOD	53	58.24
		GOOD	4	4.39
		VERY GOOD	17	18.68
	CLASSIFYING	VERY NOT GOOD	4	4.39
		NOT GOOD	38	41.75
		GOOD	38	41.75
		VERY GOOD	11	12.08
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	30	32.96
		NOT GOOD	17	18.68
		GOOD	17	18.68
		VERY GOOD	27	29.67
	GRAPHS	VERY NOT GOOD	3	3.29
		NOT GOOD	7	7.69
		GOOD	26	28.57
		VERY GOOD	55	60.43
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	2	2.19
		NOT GOOD	8	8.79

	GOOD	16	17.58
	VERY GOOD	65	71.42

From Table 4, it can be seen that the results for observed science process skills (observation. communication. classification. identification of variables. graphs. and data acquisition and processing) of students on metallic heat activity were obtained for observational skill of a total of 91 students having percentage of 59. 34% and included in good category. Communication skill has percentage equal to 58.24% and included in bad category. Classification skill which included in good category and not good where each category has the same percentage that is 41.75%. Skills the identification of the variable has a percentage of 32.96% and is included in the category is not very good. The skill of making the graph has a percentage of 60.43% and included in the category very well. And the skills of obtaining and processing data has a percentage of 71.42% and included in the category very good. Then in Table 5 will display data science process skills on the activity of ice melting ice.

Table 5. Science Process Skills on ice melting activities.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	2	2.19
		NOT GOOD	17	18.68
		GOOD	39	42.85
		VERY GOOD	33	36.26
	COMMUNICATING	VERY NOT GOOD	15	16.48
		NOT GOOD	47	51.64
		GOOD	19	20.87
		VERY GOOD	10	10.98
	CLASSIFYING	VERY NOT GOOD	11	12.08
		NOT GOOD	35	38.46
		GOOD	30	32.96
		VERY GOOD	15	16.48
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	35	38.46
		NOT GOOD	15	16.48
		GOOD	16	17.58
		VERY GOOD	25	27.47
	GRAPHS	VERY NOT GOOD	3	3.29
		NOT GOOD	10	10.98
		GOOD	18	19.78
		VERY GOOD	60	65.93
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	1	1.09
		NOT GOOD	48	52.74
		GOOD	20	21.97
		VERY GOOD	22	24.17

From Table 5, it can be seen that the results for observed science process skills (observation. communication. classification. identification of variables. graphs. and obtaining and processing data) of students on metallic heat activity were obtained for

observational skills of a total of 91 students having a percentage of 42. Eighty-five percent belongings to good category. Communication skill has percentage of 51.64% and included into bad category. Classification skill has percentage equal to 38.46% and included into bad category. Variable identification skill has percentage sensor 27.47% and included in good category. Graphic skill acquired 65.93% and included into very good category. And skill of obtaining and processing data have percentage equal to 52.74% and included into bad category.

4.2. Problems

On the implementation of the basic physics lab-book. Two based on process skills also found some problems of students who are still classified as unskilled. The results of research observation for the category of unskilled will be shown by the following Table 6.

Table 6. Science Process Skills on change activity.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	4	4.39
		NOT GOOD	22	24.17
	COMMUNICATING	VERY NOT GOOD	11	12.08
		NOT GOOD	41	45.05
	CLASSIFYING	VERY NOT GOOD	0	00.00
		NOT GOOD	14	15.38
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	6	6.59
		NOT GOOD	22	24.17
	GRAPHS	VERY NOT GOOD	7	7.69
		NOT GOOD	9	9.89
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	2	2.19
		NOT GOOD	7	7.69

From Table 6, it can be seen that there are still students who do not control the indicators of the science process skill observed. That is the observation indicator has a percentage of 4.39% which is included in the category is not very good and 24.17% is included in the category is not good. The communication indicator has a percentage of 12.08% which is included in the category is not very good and 45.05% included in the category is not good. The classification indicator has a percentage of 0% which is included in the category is not very good and 15.38% included in the category is not good. The indicator of the identification of the variable has a percentage of 6.59% included in the category is not very good and 24.17% included in the category is not good. The indicators make the graph has a percentage of 7.69% which is included in the category is not very good and 9.89% % included in the bad category. And the data acquisition and processing indicator has a percentage of 2.19% which includes dalam category is not very good and 7.69% included in the category is not good.

From Table 7, it can be seen that there are still students who do not master the indicators of the science process skill observed. ie the observation indicator has a percentage of 3.29% which is included in the category is not very good and 24.17% are included in the category is not good. The communication indicator has a percentage of 28.57% which is included in the category is not very good and 26.37% included in the category is not good. The classification indicator has a percentage of 13.18% which is included in the category is not very good and 19.78% is included in the category not good. Variable identification

indicator has a percentage of 1.09% included in the category is not very good and 28.57% included in the category is not good. The indi-cators make the graph has a percentage of 40.65% which is included in the category is not very good and 10. 98% fall into bad category. And the data acquisition and processing indicator has percentage of 13.18% in the category is not very good and 19.78% included in bad category.

Table 7. Science process skills on the heat of metal activities.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	3	3.29
		NOT GOOD	22	24.17
	COMMUNICATING	VERY NOT GOOD	26	28.57
		NOT GOOD	24	26.37
	CLASSIFYING	VERY NOT GOOD	12	13.18
		NOT GOOD	18	19.78
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	1	1.09
		NOT GOOD	26	28.57
	GRAPHS	VERY NOT GOOD	37	40.65
		NOT GOOD	10	10.98
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	12	13.18
		NOT GOOD	18	19.78

Table 8. Science process skills on the heat of fluid types.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	0	0.00
		NOT GOOD	14	15.38
	COMMUNICATING	VERY NOT GOOD	17	18.68
		NOT GOOD	53	58.24
	CLASSIFYING	VERY NOT GOOD	4	4.39
		NOT GOOD	38	41.75
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	30	32.96
		NOT GOOD	17	18.68
	GRAPHS	VERY NOT GOOD	3	3.29
		NOT GOOD	7	7.69
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	2	2.19
		NOT GOOD	8	8.79

From Table 8, it can be seen that the results for the science process skills (observation. communication. classification. identification of variables. graphics. And obtaining and processing data) are still low. Observation activities have a percentage of 0.00% not good and 15.38% included in the category is not good. Communications indicator has percentage of 18.68% which is included in category is not very good and 58.24% including in bad category. Indicator of classification have percentage

equal to 4.39% including in the category is not very good and 41.75% included in the category is not good. The indicator identification of the variable has a percentage of 32.96% included in the category is not very good and 18.68% included in the category is not good. The indicators make the graph has a percentage of 3.29% of which are included in the category is not very good and 7.69% included in the category is not good. And the indicators of data acquisition and processing have a percentage of 2.19% which is included in the category is not very good and 8.79% included in the category is not good.

Table 9. Science process skills on ice melting activities.

SPS	INDICATOR	CATEGORY	FREQUENCY	%
BASIC	OBSERVING	VERY NOT GOOD	2	2.19
		NOT GOOD	17	18.68
	COMMUNICATING	VERY NOT GOOD	15	16.48
		NOT GOOD	47	51.64
	CLASSIFYING	VERY NOT GOOD	11	12.08
		NOT GOOD	35	38.46
INTEGRATED	IDENTIFY VARIABEL	VERY NOT GOOD	35	38.46
		NOT GOOD	15	16.48
	GRAPHS	VERY NOT GOOD	3	3.29
		NOT GOOD	10	10.98
	ACQUIRE AND PROCESS YOUR OWN DATA	VERY NOT GOOD	1	1.09
		NOT GOOD	48	52.74

From Table 9, it can be seen that the results for the science process skills (observation. communication. classification. identification of variables. graphics. and obtaining and processing data) are still low. ie observation activity has a percentage of 2.19% not good and 18.68% included in bad category. Communication indicator has percentage of 16.48% which is included in category not very good and 51.64% included in bad category. Indicator of classification have percentage equal to 12.08% which included in the category is not very good and 38.46% included in the category is not good. Indicator identification of the variable has a percentage of 38.46% which is included in the category is not very good and 16.48% included in the category is not good. The indicators make the graph has a percentage of 3.29% are included in the category is not very good and 10.98% included in the category is not good. Indicators of obtaining and processing data have a percentage of 1.09% which is included in the category is not very good and 52.74% included in the category is not good.

4.3. Descriptive Statistics

The results in the following table are the results of science process skills that have been analyzed with descriptive statistics.

The data in Table 10 provides information that the basic SPS of observing on change activities is more dominant than other SPS with mean value 18.4 points.

The data in Table 11 provides information that the basic SPS of observing on the heat of metal activities is more dominant than other SPS with mean value 24.9 points.

The data in Table 12 provides information that the basic SPS of observing on the heat of fluid types activities is more dominant than other SPS with mean value 33.1 points.

Table 10. Change activity.

Science Process Skills	Indicator	Standard deviation	Mean	Min	Max	Range
Basic	Observing	3.2	18.4	6.0	24.0	18.0
	Communicating	1.6	5.3	2.0	8.0	6.0
	Classifying	0.7	3.3	1.0	4.0	3.0
Integrated	Identify Variables	2.2	8.3	3.0	12.0	9.0
	Graphs	0.9	3.3	1.0	4.0	3.0
	Acquire and Process Your Own data	2.0	10.4	3.0	12.0	9.0

Table 11. The heat of metal activities.

Science Process Skills	Indicator	Standard deviation	Mean	Min	Max	Range
Basic	Observing	4.9	24.9	9.0	36.0	27.0
	Communicating	2.3	7.0	3.0	12.0	9.0
	Classifying	1.0	2.9	1.0	4.0	3.0
Integrated	Identify Variables	2.0	8.7	3.0	12.0	9.0
	Graphs	1.2	2.3	1.0	4.0	3.0
	Acquire and Process Your Own data	2.4	8.5	3.0	12.0	9.0

Table 12. The heat of fluid types activities.

Science Process Skills	Indicator	Standard deviation	Mean	Min	Max	Range
Basic	Observing	2.1	33.1	20.0	44.0	24.0
	Communicating	1.7	4.9	2.0	8.0	6.0
	Classifying	1.4	5.1	2.0	8.0	6.0
Integrated	Identify Variables	3.1	6.9	3.0	12.0	9.0
	Graphs	0.8	3.4	1.0	4.0	3.0
	Acquire and Process Your Own data	1.9	9.8	3.0	12.0	9.0

Table 13. Melting ice activities.

Science Process Skills	Indicator	Standard deviation	Mean	Min	Max	Range
Basic	Observing	7.5	38.9	19.0	58.0	39.0
	Communicating	2.2	6.8	3.0	12.0	9.0
	Classifying	0.8	2.5	1.0	4.0	3.0
Integrated	Identify Variables	3.2	6.8	3.0	12.0	9.0
	Graphs	0.8	3.4	1.0	4.0	3.0
	Acquire and Process Your Own data	1.8	7.9	5.0	12.0	7.0

The data in Table 13 provides information that the basic SPS of observing on melting ice activities is more dominant than other SPS with mean value 38.9 points.

4.4. Discussion

The skill of the science process is a skill that must be possessed by a physics student as a prospective teacher. Process skills are skills acquired through fundamental skills. Where these basic skills will develop even higher skills. Rillero (1998) individuals find it difficult to develop high-order thinking skills if they cannot use science process skills. Process skills are also considered as a scientific method used to train students' steps in finding something through experimental activities. Karamustafaoğlu (2011) process skills are very useful to be able to find the concepts learned by participating in conducting laboratory experi-ments. Science process skills consist of basic process skills and process integration skills. Turiman et al, (2012) science process skills are divided into two parts: basic process skills and integrated process skills.

Description of result of science process skill on temperature and caloric material of physics education student at Jambi University on temperature and heat material presented by Table 2 to Table 6 with total of 4 activities and 6 indicator of observed process skill (observation. communication. classification. identification of variable. create graphs. and obtain and process data). The importance of science process skills for physics education students where they are trained and trained to become a teacher is that later the students they teach will be directly involved in an experiment. That meaningful learning is a learning that can involve students directly and learning will be easy to remember. Rubin and Norman (1992) said that A teacher who can perform a science process skill is better at helping students achieve the mastery skill process. From the result of the research. it can be seen that the result of students' skill process skill varies. From skilled to unskilled.

In the form change activity for basic SPS obtained the result of classification SPS which has the biggest percentage that is 50.54% student and this is a very good category and show that student has skilled. This can be seen from the students can classify the amount used in practical activities. Furthermore, in the heat of metal activity. The result of the percentage is 56.04% in the observation SPS and this is categorized well. Indicating that the students are quite skilled at observing. Observations are categorized quite skillfully because the students are still not careful in using and observing the scale of measuring instruments used in metal caloric activity so that many of the students who do the lab but not completely true.

In the caloric activity of the liquid type. Because it still uses the same measuring instrument with the heat of the metal type. for the observed SPS. The average is 59.34% in the good category and show the students quite skilled. Lastly, in the heat melting activity. SPS communication obtained has the highest percentage of 51.64% and this goes into the bad category. it indicates that the student is not skilled. SPS communication plays an important role in an experiment because students are required to be able to present their findings and explain what goes on during the experiments. Bilgin (2006) that students should group information obtained from observations. Then communicated to others.

In addition to basic skills. The basic physics practical 2 guideline also focuses on integrated process skill. Where in the practical activity changes and practical activities of heat liquid gene obtained that the ability to obtain and process data as a percentage of 70.32% and 71.42% respectively. This figure is high in terms of acquisition skills and data processing. This is based on the students' observation ability which is also high in this practical. Where observation ability is the most basic skill which supports the next skill mastery including mastering skill of the integration process that is skills gaining and processing data. Zeiden and Jayosi (2014) basic process skills are skills that support the development of integrated process skills.

As for the activities of heat practical type of metal found the skills of identifying variables have a percentage of 42.85%. This figure is classified as low-skill mastery. It is based on the student's ignorance of what is meant by variables. While identifying variables is a very necessary thing in doing experiments. Kalemkuş et al (2016), in addition the low factor of students' variable identification skills is also based on the traditional teaching that is still used by the teacher. Alrabaani (2014) integrated science process skills cannot be developed with traditional methods.

In the practical activity of ice melting ice obtained the percentage of skill to create a graph of 65.93%. The percentage of process skills is greater than the skill of identifying variables and can be categorized into skilled categories. It is also based on

students' high observation skills. Where graphic skill can give meaning to the observation result. Glazer (2011) the graph is very important in the investigation process used to analyze and show a quantitative relationship.

Although both the basic and integrated science skill indicators have a high percentage. There are still some students who do not possess the skills indicators. This is shown in Table 6 to Table 9. There is a reason why there are still students who do not have these indicators. Based on the results of interviews that have been done. Students mentioned that they are difficult in identifying the tools and materials that will be used when practicum. This is because they are unaware of their early skills about the lab and the lack of student experience in using practicum tools while on a high school education level. National Research Council (2006) in laboratory experiences. Students may learn to use the tools and conventions of science. When students are directly faced with tools that have never been seen before. The student will be passive so that the lab activities are not done well.

Conclusions

From the results and analysis of data, observation sheet can be concluded that the science process skills of physics education students of Jambi University are quite skilled or good. Guidebook for Physics Basics Guide 2 based on the science process skills used to generate and grow the science process skills that are owned or not owned by physics education students.

Recommendations

Physics education study programs should be able to apply a process-based practical guidebook to improve the skills of the science process through practicum activities. Aydoğdu (2015) Laboratory activities have a major impact on improving students' science process skills. In addition, lecturers should be involved in improving students' science process skills that can be done through lectures. Ongowo and Indoshi (2013) encouraging the development of science process skills is the goal of every science lecturer.

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