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RELATIONSHIP BETWEEN THE PERCEPTION AND SKILLS OF STUDENT BASIC SCIENCE PROCESS IN THE USE OF M-MODULE IN BASIC PHYSICS PRACTICUM

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ABSTRACT

This study aims to determine the relationship between perception and basic science process skills through the use of the m-module in basic physics practicum II. This research is a quantitative study using correlational design. data collection instruments used in the form of perception questionnaire instruments and observation sheets to measure students' science process skills. This study used a sample of 36 physics students at Universitas Jambi. The results of the study will be analyzed using descriptive statistics and inferential statistics. The results of this study indicate that students give a good perception of the use of the m-module in basic physics practicum II. Flat mirror material is proven from the value of the perception of 63.9% in the good category according to a predetermined range. And the basic science process skills of students are in a good category with a percentage of 50.0%. Pearson correlation results show the number 0.756 and sig < 0.05 which is 0.00, this shows that there is a strong relationship between perceptions and students' science process skills in using the m-module. This means that a high perception will result in high science process skills.

Keywords: ***perceptions', science process skills, m-module, practicum, correlation***

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Introduction

Physics is learning that explains the knowledge of the universe that requires the ability to continue to be trained in order to increase the power of thought and the ability of reason (Astalini, Kurniawan, & Sumaryanti, 2018). Physics is considered difficult by students because students are not interested in learning physics (Astalini, Kurniawan, Perdana, & Kurniasari, 2018). Learning physics has a good influence (Astalini, Kurniawan, Darmaji, Sholihah, & Perdana, 2019) for life because the discovery of physics provides many advantages and good effects. Students 'interests and abilities are needed to support students' attitudes towards learning physics (Astalini, Kurniawan, Melsayanti, & Destianti, 2018). One way that can attract students' interest in learning physics is when doing practicum activities because students can do theories that are learned in real life.

Practicum is learning that proves the principles and concepts of physics through experimental activities in the laboratory (Darmaji, Kurniwan, & Irdianti, 2019). In practical activities, students are able to observe, plan experiments, interpret data, conduct experiments, and communicate data on the results of experiments. These activities are activities that can improve student science process skills (SPS). SPS is the ability to process scientific thought and the ability to process actions to develop an understanding of scientific concepts (Darmaji, Kurniawan, Parasdila, & Irdianti 2018). In learning science, process skills consist of basic process skills and integrated process skills. According to Rezba, et all (2007), the skills of basic science process skills include observing, communicating, classifying, inferring, and predicting while integrated science process skills include identifying variables, constructing a table of data, constructing a graph, describing relationships between variables, accounting and processing your own data, analyzing investigations, constructing hypotheses, defining variables operationally, designing experiments, and experimenting.

Science Process Skills can also be used to find problems, scientific research, obtain scientific information and generalize it (Darmaji, Kurniawan, Suryani, & Lestari, 2018). The science process skills of students can be seen from the way students use tools in the laboratory (Maison, et all 2019). To improve students' science process skills a practical guide is needed that uses a science process skills-based learning model. The need to improve students' science process skills, which can be used as provisions in applying scientific methods to obtain new knowledge (Darmaji, Astalini, Rahayu, & Maison, 2018). As professional physics teacher candidates, they must be able to train and develop students' knowledge (Darmaji, Kurniawan, Parasdila, & Irdianti, 2018). According to (Darmaji, Kurniawan, & Suryani, 2019) a science process skill-based manual can improve students' science process skills in basic physics practicum II. To improve students 'science process skills, students' motivation is needed to do practicum although students can do it with peer tutors (Astalini, Kurniawan, Sulistiyo, Perdana, & Susbiyanto, 2019). According to (Darmaji, et al, 2019), Practicum guides are a source of learning in practicum activities that must be able to develop students' science process skills.

One of the materials in basic physics practicum I is reflecting on a flat mirror. Reflection is a basic characteristic of light that can be learned from practical activities (Myers, 2013) A practical guide is a guide that can improve students' thinking skills (Darmaji, Kurniawan, & Lestari, 2018). Performance appraisal assessments can improve science process skills by observing indicators, asking questions (Astalini, Kurniawan, & Nurfarida, 2018). According to (Darmaji, et al, 2019) students' perceptions of the use of m-modules in basic physics practicum II have good perceptions because m-modules can support practicum activities better and students can access the guidebook anytime and anywhere. So students are able to independently achieve the goals of practicum activities (Ediansyah, Kurniawan, Salamah, & Perdana 2019). The same thing was conveyed by (Darmaji et al., 2019) that the use of m-modules in practicum received positive responses from students because the m-module became one of the learning media that could increase students' motivation to gain knowledge. The science process skills of students increase through the use of m-modules in basic physics practicum II (Astalini. Darmaji. Kurniawan, Anwar, & Kurniawan, 2019). If students' perceptions are poor about the skills students must have, students will find it difficult to improve these skills (Kurniawan & Sumadi, 2016). Use of m-module to overcome a problem in learning activities, which is useful in facilitating, and providing ways for students to be able to understand what material is explained by the lecturer (Darmaji, Kurniawan, Astalini, & Nasih, 2019). So that when students have a good perception of eating students will be motivated in improving students' science process skills. The purpose of this study was to determine the relationship between students perceptions and

students' mastery of Basic Science Process Skills on the use of m-modules.

Research Methods

The research design used in this study is quantitative associative research with correlational research designs. Quantitative research methods are methods used to test populations or specific samples. Which aims to test hypotheses that have been made (Sugiyono, 2018). Correlation research in which variables and parameters are related to one another and information is systematically integrated as theories begin to develop (Cohen, Manion, & Morrison, 2007). The design of the study was applied because it was in accordance with the objectives of the study, namely to find out the correlation between the perceptions of students with basic science process skills at Physics Education at the University of Jambi.

The subject of this were 36 students from Physics Education. This study used random sampling. Random sampling has two key advantages. It is free of the systematic bias that might stem from choices made by the researcher, and it enables the analyst to estimate the probability of any finding actually occurring solely by chance (Gorard, 2004).

The collection of perception data on mobile-based physics practicum guides uses a perception questionnaire with five answer choices guided by the Likert scale with categories of strongly agree, agree, doubt, disagree, and strongly disagree. This questionnaire was made through Googleform technology which was then disseminated using social media.

The perception questionnaire in this study was adopted from previous studies (Ririn, 2019). This questionnaire was valid and reliable with Cronbach alpha is 0.896. An instrument is said to be reliable if the Cronbach alpha value> 0.6 (Siregar, 2015). The students' perception questionnaire on using the m-module contained 20 statements. Physics students' perceptions are expected from the questionnaire in the form of answers to agree or disagree by giving a score for each positive statement as follows: strongly agree = 5, agree = 4, doubtful = 3, disagree = 2, and strongly disagree = 1 . Scoring for each negative statement as follows: strongly agree = 1, agree = 2, doubt = 3, disagree = 4, and strongly disagree = 5 (Sugiyono, 2018). To strengthen student perception, data collection is also done through interviews. Categorizations for student perception questionnaire are listed in table 1.

Table 1. Levels of student perception

Interval	Category
20.0 – 36.0	Very Not Good
36.1– 52.0	Not Good
52.1 – 68.0	Enough
68.1 – 84.0	Good
84.1 – 100	Very good

Then to determine the mastery of science process skills students use observation sheets with 16 indicators. Basic science process skills, namely observation, classifying, measuring, inferring, predicting, communicating. Integrated science process skills namely, Identifying Variables, Create A Table Data, Making A Graph, The Relationship Between Variables, Obtain and Process Data, Analyze Investigation, Arrange Hypotheses, determining operational variables, Designing Investigation, and Conducting Experiment by (Rezba, Sprague, McDonnough, & Matkins, 2007). This observation sheet uses a Likert scale with the biggest weight four and the smallest weight 1. The results of students' perceptions of the use of the m-module and the results of science process skills student mastery will be analyzed using descriptive statistics. A description or presentation of large amounts of data that include the mean, mode, median, maximum and minimum is descriptive statistics (Cohen, Manion, & Morrison, 2007). Table 2 ranges the basic science process skills of students using m-modules in basic physics practicum II in flat mirror material.

Table 2. Basic SPS Range Students use the m-module on flat mirror material

Category	Interval Basic Science Process Skills				
	Observation and communication	Classifying	Measuring	Inferring	predicting
Very Not Good	10 – 17,5	8 – 14	12 – 21	11 – 19,25	9 – 15,75
Not Good	17,6 – 25	15 – 20	22 – 30	15,26 – 27,5	15,76 – 22,5
Good	25,1 – 32,5	21 – 26	31 – 39	27,51 – 35,75	22,51 – 29,25
Very Good	32,6 – 40	27 - 33	40 – 48	35,76 – 44	29,26 – 36

Data will be analyzed using SPSS 22 program to obtain the percentage, frequency and mean of the data. The range of relationship levels (Correlation) in table 3.

Table 3. Range of correlation levels

Coefficient Interval	Range of correlation Levels
0.80 – 1.000	Very Strong
0.60 – 0.799	Strong
0.40 – 0.599	Enough
0.20 – 0.399	Weak
0.00 – 0.199	Very Weak

(Sunarto, 2015).

Result and Discussion

This study aims to determine relationship between students' perceptions basic science process skills students using m-modules in basic physics practicum II in Physics Education Universitas Jambi.

Perception is acceptance, selection, organizing, and reacting to the stimulus of an object (Fitriani, 2016). Perception is closely related to the five senses because we can provide the perception of an object because we see, hear or feel the object. Physics students' perceptions of the use of the m-module in basic physics practicum I can be seen in table 4.

Table 4 shows that the perception of Physics Education students is in the good category with the largest percentage at 63.9%. The maximum value on the perception of Physics Education students is 100, and the minimum value is 59.00. From the disturbances of the perception score. The average score of perception of Physics Education students is 73.04. The median of physics education student perception data is at a score of 68.50. In table 5, there are student KPS results using the m-module.

Table 4. Students' perceptions of the use of m-modules

	Classification			Mean	Median	Min	Max	%
	Interval	Category	Total					
	20 – 40	Very not good	0					0
Perception's	41 – 60	Not good	5	73,05	68.50	59,00	100,0	13,9
	61 – 80	Good	23					63,9
	81 – 100	Very Good	8					22,2
Total			36					100

Table 5. Descriptive statistical analysis result of Basic science process skills students used m-module

	Classification			Mean	Median	Min	Max	%
	Interval	Category	Total					
	60 – 105	Very not good	0					0
Science Process skills	106 – 150	Not good	4	184,83	188,00	120,00	213,00	11,1
	151 – 195	Good	18					50,0
	196 – 240	Very Good	14					38,9
Total			36					100

Table 6. Descriptive statistics analysis of basic science process skills

	Indicator	Mean	Median	Mode	Max	Min
Science Process Skills	Observing	32,69	33,5	38	40	22
	Communicating	30,94	31,00	29	40	21
	classifying	24, 72	26,00	28	30	16
	Measuring	36,58	37,00	37	48	23
	Predicting	26,27	26,50	26	36	11
	Inferring	33.61	32.00	28	43	24

Table 5 shows the students' science process skills when using the m-module. The results of students'science process skills in Physics Education showed that science process skills students' physics education students were in the good category with a percentage of 50.0%. With a minimum value of 120.00 and a maximum value of 213,00. From the distribution of perception scores. The average science process skills score of physics education students is 184.83. The median of science process skills student's data is 188.00. In table 6 there are descriptive statistical analysis results from students' Basic Science Process Skills data.

From table 6. It is known that the results of descriptive statistical analysis on basic science process skills. The indicator has a median of 33.5, a mode value of 38 and an average yield of 32.69

and a maximum value of 40 and a minimum value of 22. On the communication indicator we get an average of 30.94, a median of 31.00 and the result of mode is 29, while the maximum result is 40 and the minimum result is 21. In the classification indicator the descriptive statistical results are obtained, namely the average yield of 24.72, the median yield of 26, and the mode result of 28, while the results of the a maximum value of 30 and the result of a minimum value of 16. On the measuring indicator produces an average value of 36.58, a median value of 37.00 and a mode result of 37. While at a maximum value of 48 and a minimum value of 23. On the prediction, indicator obtained an average result of 26.27, a median value of 26.50 and resulted in a mode of 26. While the maximum value of 36 and the minimum value of 11. The indicator to the Conclusions obtained an average of 33.61, a median value of 32.00 and a mode value of 28. While a minimum value of 24 and a maximum value of 43. In Table 7 there is a percentage result of the value of students' basic Science Process Skills Based on the results of the analysis of the two data, namely the perception of the use of m-modules and Science Process Skills students' use m-modules at the practicum. Furthermore, in table 6, the relationship between student perceptions and science process skills students has been found to use the m-module.

Table 7. Category basic science process skills

Indicator	Interval	Category	Total	%
	10 – 17,5	Very Not Good	0	0
Observing	17,6 – 25	Not Good	5	13,9
	25,1 – 32,5	Good	12	33,3
	32,6 – 40	Very Good	19	52,8
Total			36	100
	10 – 17,5	Very Not Good	0	0
Communicating	17,6 – 25	Not Good	6	16,7
	25,1 – 32,5	Good	16	44,4
	32,6 – 40	Very Good	14	38,9
Total			36	100
	8 – 14	Very Not Good	0	0
Classifying	15 – 20	Not Good	6	16,7
	21 – 26	Good	13	36,1
	27 – 33	Very Good	17	47,1
Total			36	100
	12 – 21	Very Not Good	0	0
Measuring	22 – 30	Not Good	5	13,9
	31 – 39	Good	18	50,0
	40 – 48	Very Good	13	36,1
Total			36	100
	9 – 15,75	Very Not Good	5	13,9
Predicting	15,76 – 22,5	Not Good	4	11,1
	22,51 – 29,25	Good	13	36,1
	29,26 – 36	Very Good	14	38,9
Total			36	100
	11 – 19,25	Very Not Good	0	0
Inferring	19,26 – 27,5	Not Good	3	8,3
	27,51 – 35,75	Good	18	50,0
	35,76 – 44	Very Good	15	41,7
Total			36	100

Based on the results of the analysis of the two data, namely the perception of the use of m-modules and the science process skills of students using the m-module during practicum. Furthermore, in table 8 we have found a relationship between students 'perceptions and students' science process skills on the use of m-modules.

From table 8 you can see the sig 0,000 results and Pearson correlation results from 0.756. According to Cohen (2007), if the probability <0.05 then the second variable has a significant relationship, the results of the SPSS show 0,000 <0.05 so that the perceptions and skills of students' basic science processes have a significant relationship. To find out how strong the relationship between these variables can be seen from the Pearson correlation results. According to Sunarto (2015), the range of relationships at 0.00 - 0.199 = very weak, 0.20 - 0.399 = weak, 0.40 - 0.599 = enough, 0.60-0.799 = strong, and 0.80 - 1, 00 = very strong. The results approved by SPSS

show Pearson correlation = 0.756, so students' perceptions and basic science process skills in using the m-module have a strong relationship.

Table 8. Relationship of students' perceptions of the use of m-modules and the Science Process Skills of students using m-modules

		Science process skills
Perceptions'	Pearson Correlation	.756
	Sig. (2-tailed)	.000

M-module becomes a media to support practicum activities. As a learning resource m-module can provide learning motivation for students. As a form of student motivation can be seen from the ability of students to prepare the process of practicum activities through m-modules that are more flexible and can be accessed anywhere and anytime (AlHajri, Al-Sharhan, & Al-Hunaiyyan, 2017); (Irina, Irina, Anastasia, & Elena, 2019). The use of m-module is considered to be a physics education student who can increase his knowledge. By using the m-module students can add information from different references and be more flexible always to use. So that the use of m-modules get a positive attitude from students because they have the benefits of the m-module (Adel & Rafie, 2017). Then the use of m-modules will support the independence of students in finding information that can be accessed anywhere and anytime.

Based on this, the students agreed to the use of the m-module as a more efficient learning resource in preparing knowledge for practicum activities. Electronic resources (non-print media) have replaced print media in the digital era, but the main thing to note is the training of young people who will be able to think critically and reject negative influences from outside (Vyas & Nirban, 2014); Zhdanko, 2019). Based on these results, it can be concluded that students provide a good perception of the use of m-modules in supporting more effective practicum activities. This is supported by research (Maroah, Siswanti, Muafi, & Isfianadewi, 2018).

Science Process Skills are skills that are used to obtain new information or knowledge, formulate a problem and how to solve the problem, there are several reasons why students' process saims must be improved, because 1) the development of science is developing fast so students must be able to find concepts independently, 2) students will easily understand complex concepts through the use of concrete examples, 3) the findings are comparative, so that they can argue if they find new data that can be proven previous errors (Semiawan, 1992). As a professional physics teacher, students must have a provision in using scientific methods in developing scenes as well as gaining new knowledge or developing existing knowledge (Nworgu & Otum, 2013).

In this study, with 16 indicators of SPS namely, Basic science process skills, namely observation, classifying, measuring, inferring, predicting, communicating. Integrated science process skills namely, Identifying Variables, Create A Table Data, Making A Graph, The Relationship Between Variables, Obtain and Process Data, Analyze Investigation, Arrange Hypotheses, determining operational variables, Designing Investigation, and Conducting Experiment. Basic Science Process skills Students were in a good category. For the assessment of Basic Science Process Skills using six indicators, they are namely observing, communicating, classifying, measuring, inferring, and predicting. In the observation indicator, students observe the tools and materials needed for the practicum reflecting on a flat mirror. Student observation skills can be seen from students' skills in identifying between differences and similarities of objects. Students can identify differences and similarities between several tools and materials, as well as the results of several experiments. In addition, students are also able to explain an example of an experiment based on observations that have been made previously. This is supported by (Safaah, Muslim, & Liliawati, 2017). Students are also able to illustrate the results of experiments on the experiment table. In the observation indicator, as many as 19 students have excellent observation skills, as many as 12 students have good observation skills, and five students have poor observation skills. This shows that the use of m-modules in basic physics practicum II on flat mirror material can improve student observation skills.

In communicating indicators, students are able to discuss with classmates in designing experiments to be conducted. Then students do practical activities by working with groups and discuss the results of experiments that have been found and discuss theories that support the results of experiments that they find. By having a discussion with a group of friends, students are able to accept the opinions of others, solve problems, and be able to improve skills in communicating the results of experimental data (Maison, et al, 2018). Through the use of m-modules in basic physics practicum II flat mirror

material, student communication skills are in the good category with as many as 16 students having good communication skills, 14 students having excellent observation skills, and six students having poor communication skills.

In the classifying indicator, students are required to be able to classify the results of the experiment based on certain categories. To see this skill, it can be seen from the ability of students in making data tables. Students seem to easily make a table easily from the results of a reflection experiment on a flat mirror. Students are able to make table label information, namely the angle of incidence, the angle of reflection and distance of the object. When using the m-module students have excellent category observation skills with a percentage of 47%, of which 17 students have excellent observation skills. A total of 13 students had good classification skills, and 6 students had poor classification skills.

In the measuring indicator, students are required to be able to measure the image generated on a flat mirror, measure the dating angle and the angle of reflection using a protractor. The observations showed that students were skilled in measuring the distance of the baying that was produced through the ability of students to put needles and measure the distance of shadow objects. Then students are also skilled in laying protractors, and reading dating angles, and reflection angles. Measuring skills of students can be improved through the use of mobile-based practicum guidebooks, this is evidenced from the results of measuring skills of students in the good category with a percentage of 50% with 18 students having good measuring skills. The ability to measure other students is in the excellent category of 13 people and in the bad category of 5 people.

In the indicators making conclusions, students can interpret in the form of student abilities in communicating image forming, angle of incidence, angle of reflection and shadow distance value by a flat mirror — skills in making inferences made by students using the information that has been observed to interpret. Making inferences skills includes the action of using the observed information to interpret, or they make an early conclusion (Rauf, et al, 2013). From the observations of students able to communicate well the conclusions from the results of experimental data. They are predicting forecasting future events based on past observations or patterns of the data formed (Safaah, Muslim, & Liliawati, 2017). Through the use of m-modules in flat mirror practicum students have a good category with a percentage of 50% with 18 students having good conclusion skills. And 15 students have very good conclusion skills and as many as three students have poor skills.

In the indicator making predictions can be seen with the ability of students to give predictions on the flat mirror on the relationship between the object distance and the distance of the image produced. In addition, the ability to rely on prediction with observation skills. Observation indicators generated by a good percentage. The predictive ability is very dependent on the introduction of a phenomenon that is part of the observation skills. In the prediction indicator, student skills are in the very good category with a percentage of 38.9% of which 14 students have very good predictive skills, 13 students have good skills and four students have bad skills, and 5 students have very poor skills well. From the results of data acquisition, it can be said that through the use of the m-module practised basic physics II flat mirror material, and students have good basic science process skills. When students have a positive perception of the use of m-modules in practicum, it will give students the will to improve their science process skills (Arif, 2016).

Based on the results of students' perceptions and Science Process Skills it can be said that there is a strong relationship between students' perceptions of the use of m-modules and students' Science Process Skills when using m-modules. With nil sig 0,000 and Pearson correlation value of 0.756. According to (Cohen, Manion, & Morrison, 2007), the sig value <0.05 then the relationship between the two variables has a significant correlation. this shows a strong relationship between students' perception and Science Process Skills. So it can be concluded that the m-module in basic physics practice II can be used to improve students' basic science process skills and can be used as an effective and efficient and flexible learning resource.

Conclusion

This study aims to determine the relationship between students 'perceptions of the use of m-modules and students' Science Process Skills when using m-modules in basic physics practicum II in physics education at jambi university. Based on the results found in the study, it was concluded that students 'perception of the use of m-modules and students' Science Process Skills when using m-modules in basic physics

practicum II had a relationship with the Pearson correlation value of 0.756. and the sig value <0.05 then the relationship between the two variables has a significant correlation so because between the two there is a strong relationship then a good perception will produce good Science Process Skills too.

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