

**THE BASIC ABILITY ON BASIC STATISTICS AND MATHEMATICAL
DISPOSITION OF THE SECOND SEMESTER STUDENTS OF
MATHEMATICS EDUCATION PGRI UNIVERSITY OF PALEMBANG**

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Abstract

The objectives of the research are: 1) to know the basic ability of basic statistics and mathematical disposition of the second semester students of mathematics education in PGRI University of Palembang, (2) is there any significant relationship between the basic ability on basic statistics and mathematical disposition of the second semester students of mathematics education in PGRI University of Palembang. The methods used in this research are descriptive and correlation methods. The subject of the research are students of mathematics education of PGRI University of Palembang with the total numbered 103 students. The technique of collecting the data are test and questionnaire. Based on the result of data analysis can conclude that (1) the basic ability on basic statistics and mathematical disposition of the second semester students of mathematics education in PGRI University of Palembang are fair and good. (2) There is no significant relationship between the basic ability on basic statistics and mathematical disposition of the second semester students of mathematics education in PGRI University of Palembang.

Key words: the basic ability on basic statistics, mathematical disposition, descriptive, and correlation

INTRODUCTION

Mathematics Education Study Program has the goal of generating a professional teachers in the field of mathematics. Basic statistics is one of the subject in the curriculum of mathematics education study program at Educational Faculty of University PGRI Palembang. Based on that curriculum, Basic Statistics must be taken by students in the second semester and the number of credit (SKS) is three.

At the elementary and secondary school curriculum, such as mathematics of statistical material has been studied by learners starting from elementary school (SD), Junior High School (SMP), and Senior high schools (SMA), as well as studied by every student in the university. Basic statistics is an important subject matter, because by learning it, learners will know the advantages of using statistical methods. The advantage of using the statistical method according Taliang (2010) are as follows: (1) statistics gives exact description, (2) statistics directed into the right and exact in procedures and thought, (3) statistics allow to summarize the results of observations in the form of meaningful and acceptable, (4) statistics makes it possible to be able to describe the general conclusions, and the process based on the rules received, (5) statistics allows to be able to analyze some factors that causes a complex event, and (6) statistics makes it possible to analyze many things that will happen in known and setting conditions.

Now days, within the progress of science and technology, statistical science become important. Almost all policies or decisions taken by the scientists or the executive (according to their knowledge) based on the statistical science also the results analysis and data interpretation, either in quantitative or qualitative way.

With the importance of statistics, statistics can be used as a tool to communicate, presents, describe or illustrate the data into the form of tables, figures, and diagrams, so it is easy to understand, and also statistics can be used as a tool to predict or forecast which is commonly referred in statistics as regression. Statistics has an important role in determining the decision although did not realized eventually.

Related to the subject above, students have learned the basic statistical material during the school such as measures of central tendency for single and group data, presentation of data, and dispersion. Because the basic statistics have known and studied by students before entering college it should be at the beginning of the basic statistics study, students must be tested first. By doing the test it could be known how far students has mastered the material and also as the first step for teachers to use appropriate methods in teaching and learning process.

Also known, one of the students' active participation in basic statistical study is the affective abilities. In line with Scholte et al (2010), stated that the most important factor in making active participation on learning process is student's positive attitude. Towards this behavior within the suitability of active learning method can develop the critical thinking ability of students (Hanurawan, 2012). Attitude or affective abilities associated with mathematics is a mathematical disposition.

Mathematical disposition is desire, consciousness, and a strong dedication to the student to learn and perform a variety of mathematical activities (Kesumawati, 2010). NCTM (1989: 233), stated "The assessment of students' mathematical disposition should seek information about their:

1. confidence in using mathematics to solve problems, to communicate ideas, and to reason;
2. flexibility in exploring mathematical ideas and trying alternative methods in solving problems;
3. willingness to persevere in mathematical tasks;
4. interest, curiosity, and inventiveness in doing mathematics;
5. inclination to monitor and reflect on their own thinking and performance;
6. valuing of the application of mathematics to situations arising in other disciplines and everyday experiences;
7. appreciation of the role of mathematics in our culture and its value as a tool and as a language.

Further mathematical disposition can be seen from the student desire also accompanied by action to answer a problem with changing the strategies that used to solve the problems, reflection, and analysis to obtain a solution. For example, a student can solve the problems with various strategies used to answer a problem, how much students desire to explain the obtained solution, and maintain explanation.

A learning process becomes more effective if known first the prior knowledge of each student on each every course and also their affective ability namely mathematical disposition. Based on the explanation above, in this research, the formulation of the problems are as follows:

- 1) how is the basic ability on basic statistical of second semester students of mathematics education study program on the academic year 2014/2015?
- 2) how is the mathematical disposition at second semester students of mathematics education study program PGRI university of Palembang academic year 2014/2015?
- 3) Is there any significant correlation between basic ability on basic statistic and mathematical disposition to the second semester students of mathematics education study program PGRI university of Palembang academic year 2014/2015?

METHODS OF RESEARCH

The method used in this research is descriptive and correlational method. To determine the students basic ability on basic statistics they were given a written test in the form of an essay. In addition the researcher also gives a questionnaire in order to determine the student

mathematical disposition. Questionnaires were given four choices, namely Strongly Agree (SA), Agree (A), Disagree (DA), and Strongly Disagree (SD). Tests and questionnaires were given at the beginning of Basic Statistics course. The subjects of the research were students of Mathematics Education PGRI University of Palembang in academic year 2014/2015. The total numbered of subjects was 103.

DISCUSSION AND RESULTS

Initial Capabilities on Basic Statistics

Concepts of basic ability on basic statistics that examined in this study as well as the relationship with the dimensions of the cognitive process, can be seen in Table 1. The material of basic ability on basic statistical consists of Statistics definition, central tendency, Statistics data, and Data Presentation.

Table 1

The Concept of Basic Ability on Basic Statistical and the Dimensions of Cognitive Process

No.	Konsep	Dimensi Proses Kognitif					
		Remember	Understand	Apply	Analyze	Evaluate	Create
1.	Statistics definition	✓					
2.	Central tendency		✓		✓	✓	✓
3.	Statistics data			✓	✓		
4.	Data presentation			✓			

The results of the test shows that the measures of central tendency on a single data to calculate the mean, median, and modus of the dimensions of the cognitive process stages *understand* has the highest average of 97,09. It is because the test questions form using a single data. Students tend to be familiar with a single and simpler data. From the essay questions given they were mean, median, and also modus.

For the central tendency material of cognitive dimensions on stages create students got lower score 37, 26. It is because students not familiar with questions that requires a formula to get the best results. Students don't understand within the average count known for n students and reduce with students number gained an average of new count. The last questions were how much the student's value that is not included in the final calculation. Most of the students can not answer correctly, and some students decided not to answer that question.

While on the other measures of central tendency, ie, an explanation of the arithmetic mean, median, and mode according to their own language gets the average score 77,6. This is due to the average student still remember or are already familiar with the definition of the mean, median, and modus for a single data, so they know in order to determine the median of the data must be sorted well from smallest to largest order or otherwise. From the data students can determine the modus or datum that often shown from sequence data.

Figure 1 displays the average score of each basic ability on basic statistical of second semester students of mathematics education PGRI University of Palembang in academic year 2014/2015.

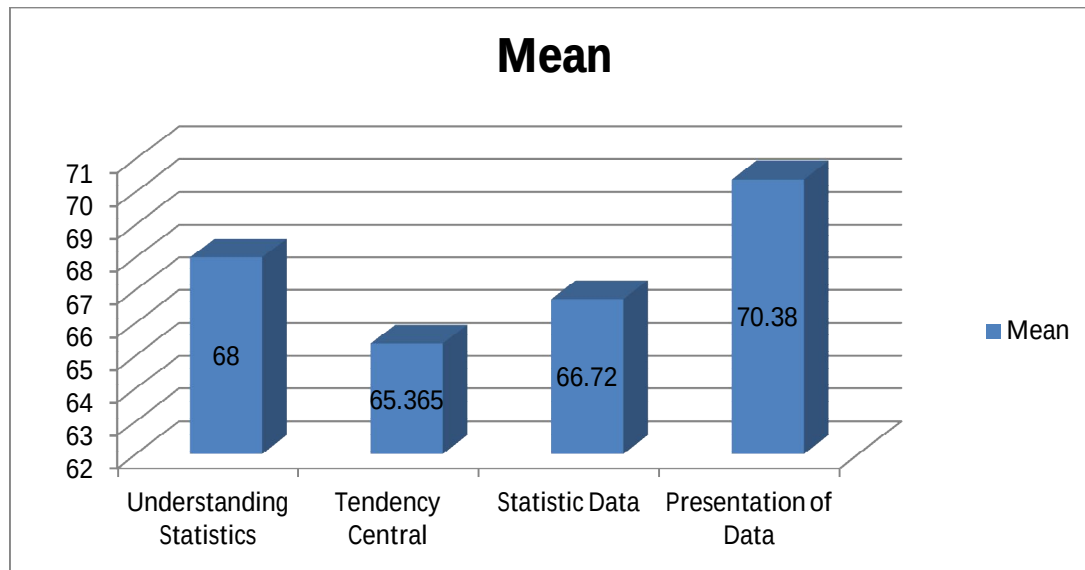


Figure 1
Mean for the Basic Ability Concept on Basic Statistics

The mean of the overall count got 67.44 in the category fair. The highest score got in the material of data presentation, this is because students can calculate the determination of the students number if known degrees from the circumference of a diagram.

Common mistakes made by the students can be grouped as follows.

- The concept of a statistical definition**, the student can explain the statistical definition but when explaining the meaning of statistical they've got difficulties.
- The concept of tendency central measures**, students are able to explain and calculate mean, median, and mode. But students are not able to resolve the story questions of an average new count if the data is added or subtracted.
- The concept of statistical data**, students able to explain the quantitative and qualitative data but most can not give an example of the data. Students are able to determine the smallest and largest data from a story question using mathematical models.
- The concept of data presentation**, students can determine and calculate the data from a circumference diagram, but there are 18 students who are not able to answer correctly.

Mathematical Disposition

Based on the results of data analysis from the questionnaire, the results of mathematical disposition of students could be summarize on seven indicators, namely: (1) self confidence on solving mathematical problems, communicating idea, and giving excuse, (2) flexibility on explore the mathematical ideas and trying any different method to solve the problems, (3) strong will to finished the mathematical tasks, (4) interesting, curiosity, and the ability to found in doing mathematic, (5) monitoring and reflecting thought and self works, (6) valuable in mathematical application on different fields and in everyday life, and (7) appreciate on mathematic in the culture of value, as well as a tools or as a language.

The summary results of a mathematical disposition from second semester students of mathematics education PGRI University of Palembang in academic year 2014/2015 can be seen below.

Table 2
The Results Scale on Mathematical Disposition

No	Indicator Mathematical Disposition	Score	Categori
01	Confidence to solve mathematical problems, to communicate ideas, and giving excuse.	73	good
02	Flexibility in exploring mathematical ideas and trying alternative methods in solving problems.	76,5	good
03	Willingness to persevere in mathematical tasks.	74	good
04	Interest, curiosity, and inventiveness in doing mathematics	75	good
05	Inclination to monitor and reflect on their own thinking and performance;	75	good
06	Valuing of the application of mathematics to situations arising in other disciplines and everyday experiences;	83	good
07	Appreciation of the role of mathematics in our culture and its value as a tool and as a language.	82	good

From the data above all the indicators of student mathematical disposition is good. On the first indicators there are nine statements. Only on the third and fourth statements students got fair value. The third statement is "I doubt that any mathematical problem can solve" and the fourth statement is "At the moment I have difficulty in working on questions, I saw my friends work", is a negative statement. The average student answered agree, this means that the student is not sure with their ability.

On the second indicator, there are four statements and third indicators have five statements in good ratings. In the fourth indicator there are seven statements got good values except the first statement is a negative value, ie, "I am not interested to study math". students got very good grade, because the average student is very interested in math. It means seen that students who studied in the mathematic study program on second semesters in academic year 2014/2015 UPGRI Palembang already have pleased with mathematics.

On the fifth indicator there are seven statements in good values, except in the third statement, ie "I am panic when get the question of new forms math test" it is a negative statement. Average students answered "agree", which means students are not familiar and yet have the maximum ability to solve a problem in mathematics.

On sixth indicator there are four statements, two of the four indicators are good statements and two others very good statement. Two very good statement was " for the future, I need to study math" and "Mathematics useful for other subjects". This means students already know about the usefulness of learning mathematics.

On the last or seventh indicator there are four statements. From the fourth statement three statements got well value and one statement got very well. Very well statement is "In everyday life I do not need math" is a negative statement. Average student answered disagree or strongly disagree, this means students believe that in everyday life mathematics is needed.

Mathematical disposition orientation through study are explore, discover, understand, applied, and live the contained values on the distribution of courses that can be used to improve understanding of mathematics and parts of mathematics. According to Pearson Education

(2000), mathematical disposition includes a genuine interest in learning mathematics, persistence to find solutions to problems, willingness to find a solution or alternative strategies, and appreciation of mathematics and its applications in various fields.

Correlation of the Basic Ability on Basic Statistics and Mathematical Disposition

The data of Basic Ability on Basic Statistics (BABS) and Mathematical Disposition (MD) scale can be seen in the score BABS and MD. The description of students score on BABS and MD can be seen in Table 3 and for correlation can be seen in Table 4.

Table 3
The Value Description of Basic Ability on Basic Statistics and Students Mathematical Disposition

	Mean	Category	Std. Deviation	N
Basic Ability on Basic Statistics	67,4395	fairly	15,67164	103
Mathematical Disposition	76,0360	good	5,41212	103

Table 4
The Result of Correlation Data Analysis

		Basic Ability on Basic Statistics	Mathematical Disposition
Basic Ability on Basic Statistics	Pearson Correlation	1	-0,024
	Sig. (2-tailed)		0,809
	F hitung		0,059
	N	103	103
Mathematical Disposition	Pearson Correlation	-0,024	1
	Sig. (2-tailed)	0,809	
	F hitung	0,059	
	N	103	103

The results analysis of the above shows that the average Basic Ability on Basic Statistics (BABS) students is 67.44 it is included in the category of fairly, with a high value is 20%, medium is 62%, and the low is 18%. The average score on mathematical dispositions is 76.04 included in good kategori, with high mathematical disposition is 37%, medium mathematical disposition is 48%, and low mathematical disposition is 15%.

Then in Table 4 it can be seen that the correlation between BABS and mathematical disposition is -0.024 included in the classification of relationships that can be ignored. Furthermore, it can be seen from the value of F_{hitung} obtained 0,809 this shows that "there is no significant correlation between student IABS with DM. Because the value of $F_{hitung} = 0.809$ is smaller than F table, with $F_{tabel} = F_{(0,09; 1; 101)} = 3.935188$.

The results of previous studies conducted by Kesumawati (2010: 70) argues that there is no significant association between the ability of mathematical understanding and students' mathematical disposition, so each learner are expected to be positive (mathematical dispositions) on the ability of mathematical understanding. In line with Mahmudi (2010) there is no association between the ability to think creatively mathematics and mathematical disposition of students.

This shows that the mathematical dispositions are the parts of the affective that can not be changed in a short time. With already known BABS and student mathematical disposition, it can help teachers to determine the method used and can also determine the grouping of students for the implementation of the study.

Conclusions and Suggestions

Based on the data analysis, it can be concluded that (1) Basic ability on basic statistical and mathematical dispositions of second semester students mathematics education study program of PGRI Palembang is fairly and good. (2) There is no significant correlation between basic ability on basic statistics and mathematical dispositions at second semester students mathematics education PGRI University of Palembang academic year 2014/2015. It could be known basic ability on Basic Statistics of second semester students of Mathematics Education is fairly, it is advisable for teachers able to implement a method that can enabling students to learn so the results of Basic Statistics can increased.

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