ANALYSIS TYPES OF ERRORS OF STUDENTS SOLVE PROBLEM MATRIX CLASS X SMK PRAWIRA MARTA OF KARTASURA

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Submitted by :

Tri Adi Nugroho

A410112002

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Name	: Tri Adi Nugroho
NIM	: A410112002
Subject	: Mathematics Education
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NIM A410112002

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Submitted by :

Tri Adi Nugroho

A410112002

This article publication has been approved by the thesis supervisor the Faculty of Education, Muhammadiyah University of Surakarta to be maintained in front of the thesis examiners.

Surakarta,

Dra. Nining Setyaningsih, M. Si.

NIP/ NIK 403

ANALYSIS TYPES OF ERRORS OF STUDENTS SOLVE PROBLEM MATRIX CLASS X SMK PRAWIRA MARTA OF KARTASURA

Tri Adi Nugroho[1] and Nining Setyaningsih[2]

[1]Student of Mathematics Education UMS triadinugroho3@yahoo.com

[2] Lecturer of Mathematics Education UMS ningsetya@yahoo.com

ABSTRACT

Tri Adi Nugroho / A410112002. **TYPES ANALYSIS OF STUDENT'S ERRORS SOLVE THE PROBLEM MATRIX CLASS X SMK PRAWIRA MARTA KARTASURA**. Skripsi, the Faculty of Education, Muhmmadiyah University of Surakarta. June 2015.

The purpose of this research to know types and factors that cause students to solve problems error matrix of class X Accounting SMK Prawira Marta Kartasura. This research is a qualitative research with mixed methods research design (mixed methods) using tringulasi design type. Subjects were interviewed as many as 5 students were taken from students who do a lot of errors in that classroom at most make a error that class X AK. Methods of data collection using tests, observations, interviews, and documentation. Data analysis technique is done through three stages, namely data reduction, data presentation, and conclusion. From the data obtained by the analysis of student answers and interviews show that (1) the errors done mathematically students in solving a matrix is a communication error, a error to apply the formula, and error when calculating. (2) the percentage of errors made students in solving a matrix, namely mathematical communication errors committed students to interpret the language question into the ordinary language by 22%, errors to apply the formula that made the students in using the wrong concept to resolve the matter by 50 %, and errors made when calculating the student at the time of surgery numbers by 51% (3) factors that cause students errors namely students do not understand the questions well, students either do not understand the concepts that will be used, and the student has not mastered the number operations.

Keywords: error factor, qualitative, error type, tringulasi, about the matrix

1. INTRODUCTION

Education is very important, especially in the teaching and learning activities. This is a process where the transfer of knowledge between teachers and students. A lot of knowledge that is submitted in the teaching and learning activities. One of them is the field of study of mathematics.

Matrix is one of the materials in math which includes difficult. Matrices are taught to class X SMK has allocated 12 hours of lessons. The material in operation in different matrices with operations in numbers. Therefore, the matrix includes materials that are difficult to understand students. Resulting in a lot of errors in solving problems of matrix.

The low learning achievement is also indicated, among others, the low value of daily tests, repeat the semester, or UAN (National Exam) mathematics. In fact, according to data from the Trends in Mathematics and Science Study (TIMSS) 1999 Indonesia mathematics achievement in general is ranked 34 out of 38 countries, in 2003 was ranked 35th out of 46 countries, and in 2007 was ranked 36th out of 49 participating countries which involved more than 200,000 students. The average value of all the students from all over the country in 2007 was 500 and the standard deviation is 100. The samples in Indonesia is based on three strata, namely the type of school (SMP / MTs), school status (State / Private), and school performance (good / Medium / less). Overall, a total of 150 SMP / MTs public and private with good category, moderate, and less. Selected as the sample number 5848, 5762, and 5648 students participated in the study each year round. From the empirical data it is clear that the mathematical ability of Indonesian students in general is very low. (litbangkemdikbud, 2011).

From interviews at the time of observation of the teacher in the class X SMK Prawira Marta Kartasura. Standard completeness value of report in vocational Prawira Marta Kartasura subjects of mathematics is 71. From the daily test results of class X in the material matrix of students who completed the

matrix material is 54.55%. While students who have not completed that is 45.45%. The sum of all students of class X there were 92 students.

So that improve student learning outcomes, it is necessary and appropriate learning methods required to find out an analysis to determine whether there is an error students. In order to know the extent of the error made by the students and to know where the location of the error made. Therefore, to improve student learning outcomes, required further study analysis on any errors made students.

Sri Wahyu Koem (2014) concluded that the errors committed students are not mastering the concept, errors in calculation, and errors in understanding the problem. The percentage of errors made is the misconception of 47.2%, 8.7% an error calculation, an error in understanding problem 8.7% and an error in using the notation 0%. Of the percentage of an error can be seen that the error that many do students are misconceptions.

The purpose of this study was to describe the fault location, describing the percentage of an error, and to describe the factors that cause one in mathematical communication, applying the formula, and when the counting is done the students in solving a matrix.

2. RESEARCH METHODS

The research is a qualitative research, because in this study to obtain information about the location, type, and the factors that cause an error of students in solving matrices. While the design used in this research is mixed method research designs because the data collected and presented obtained from quantitative and qualitative data. In this study, using a mixed methods research design tringulasi design type.

The data in this study consisted of primary data and secondary data. Primary data is data obtained directly from the subject of the research is to analyze the student was an error in solving matrix interview. And while

secondary data is the data obtained from the other party or indirectly from the subject.

A resource in this study involved students of class X SMK AK Prawira Marta Kartasura academic year 2014/2015. Based on the results of the test are tested to them, the students who did the most numerous and varied layout and the type of error will be made subjects in this study. Subjects in this study does not represent the class, but representing the subject itself.

The data in this study were collected through a principal methods and methods auxiliary. The main methods used by researchers to collect data using written tests while auxiliary method that researchers use to collect data using the method of observation, interviews, and documentation.

The main instrument in this study is the researchers themselves, because the researchers who will plan, design, implement, collect data, analyze the data, draw conclusions, and report the results. Other supporting instrument in this study is a test and interview.

3. RESULTS AND DISCUSSION

Based on the results of student work that has been collected from class X AK who take the test, the researchers create a table for each question. The table shows the number of right and wrong problem amount of work students on tests. The data obtained by researchers will be presented in table form as a description of calculation errors made students as follows:

TABLE 4.1 The number of errors made students of class X AK

Type of Error		No. Item					Total
		1	2	3	4	5	
I	∑T	17	14	18	15	18	82
	∑F	4	7	3	6	3	23

II	∑T	20	5	21	6	0	52
	∑F	1	16	0	15	21	53
III	∑T	9	8	15	1	18	51
	∑F	12	13	6	20	3	54

Description:

Based on the data presented above, the data processing will be entered into the formula error percentage of students. As for knowing the percentage of errors made the students. Researchers using the following formula:

$$P = \frac{\sum F}{\sum F + \sum B} x\ 100\%$$

The next the percentage of errors made students of class X AK in every aspect as follows.

TABLE 4.2 The results percentage calculation formula of class X AK

Type of Error		Total	Persentase
I	∑T	82	22%
	∑F	23	
II	∑T	52	50%
	∑F	53	
III	∑T	51	51%
	∑F	54	

Based on the results of interviews to students. Of the five questions given there are some problem that are difficult to work with students, among others,

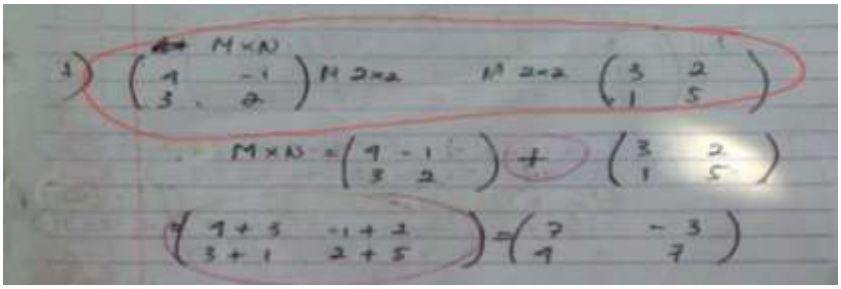
problem numbers 1, 2, and 4. Error experienced by students in the numbers using the negative sign and berordo 2 x 2 matrix.

Based on the results of interviews with teachers of mathematics, students have problems and an error in mathematics learning matrix material. Constraint that are often experienced by students that some students still do not do their homework given by teachers and students sometimes still difficult prompting teachers to come forward. For students less scrupulous counting mistakes. Moreover, if the sum of negative numbers sometimes surgery operations of addition becomes multiplied when it relates to errors in the operating matrix.

After analyzing the data in the study. Researchers get the data in the form of value and the number of students who make mistakes in solving problems of matrix. The problem in this research is to analyze students' mistakes in solving the matrix. Each - each student experienced an error will be discussed as follows:

1. Error type I (Error mathematical communication)

This type of error is an error that made the students to interpret the language problem into everyday language on the students' answers. Mathematical communication errors committed by students on the problem the matrix is relatively low at 22%. Errors made by students on this aspect a lot done in problem numbers 1, 2, and 3.



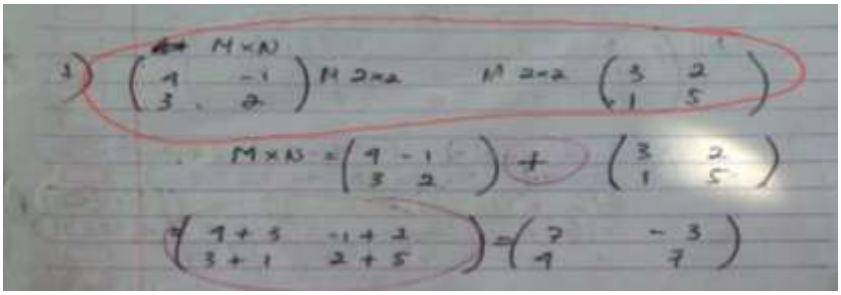
PICTURE 1 Students' answers to question no. 1 in mathematical communication an error

The top answer no. One of the students who are mathematically communication error. In the answer sheets are marked in red is the an error of students in solving problems. Mistakes made by students that is less focused on attention problem. Where students often rush in reading problem. Students only read 1-2 times without understanding the questions that will be done. After working students are confused middle of the road. It was caused by a lack of students in understanding problem. Data that students write in the answer sheet upside down in writing or incomplete in writing.

Sri Wahyu Koem (2014) concluded that the error in understanding the problem in determining the inverse matrix of 2 x 2 this is because students are less profound in understanding the problem so that they do not find information problem major of them and they were not able to describe the problem to find the right solution in resolving the problem.

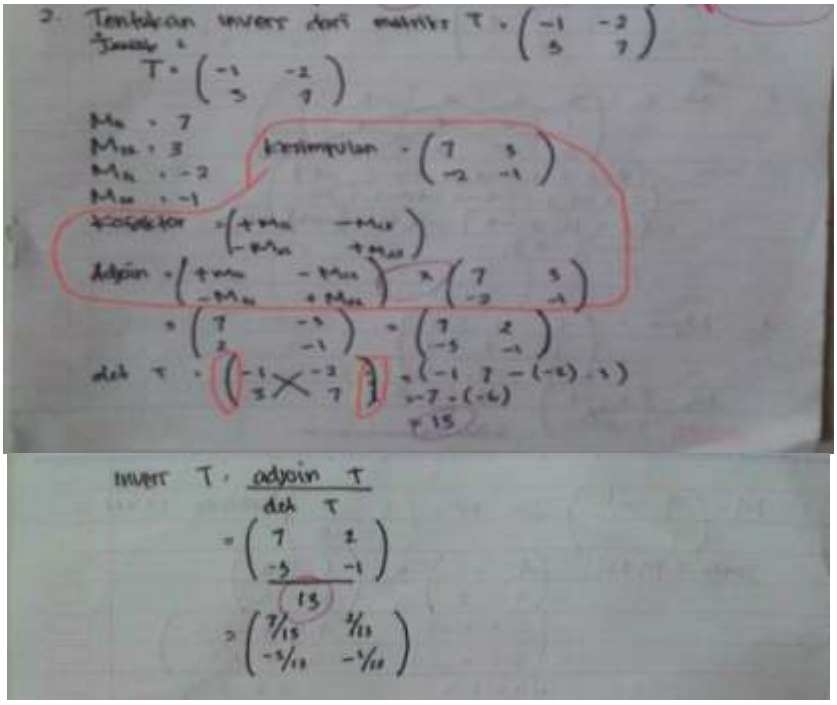
2. Error type II (Error applying concepts)

This type of error that the student made an error in using a formula to resolve the problem on the students' answers. Error applying formula made by the students in problem is classified matrix that is equal to 50%. Errors made by students on this aspect a lot done in problem numbers 1, 2, 4 and 5.



PICTURE 2 Students' answers to question no. 1 in applying the concept of an error

From the responses of the students at the top there is an error to apply the concept. Where students experience the error in using the formula. It is the students were confused to apply the concept of the use of the addition operation matrix with matrix multiplication operations.

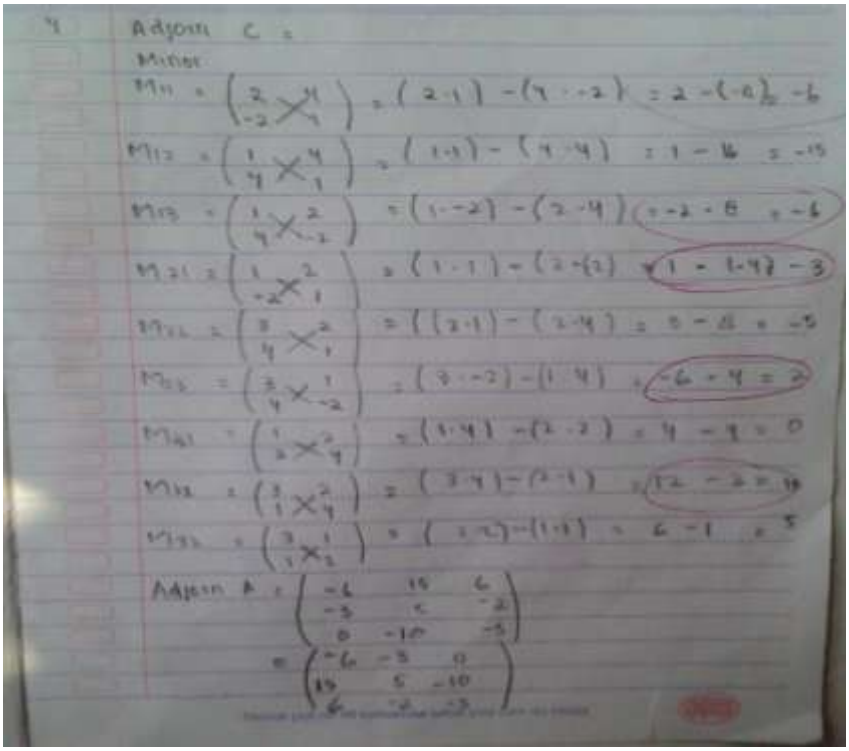


PICTURE 3 Students' answers to question no. 2 in error to apply the concept

From the students' answers above. Students experience an error in applying the concept to resolve the problem. The concept of berordo 2x2 matrix has its own rules in order to more easily solve, but the students use the concept of minor and cofactor are typically used to order 3x3. So that students experience the confusion that results in an error in resolving the problem.

3. Error type III (error when calculating)

Errors of this type are errors made students when calculating operating his number. Error when counting is done by the students in problem is classified matrix that is equal to 51%. Errors made students on this aspect a lot done in problem numbers 2 and 4.



PICTURE 4 Students' answers to question no. 4 in an error when calculating

From the students' answers no. 4 above. Students experience a lot of an error when calculating. The error can be seen on the student answer sheet that has been marked with a red line. Looking for a minor of order 3x3 matrix using a lot number operations. Students did not master the material in a number operations, especially in negative numbers. In addition, students are also less conscientious or rush in the count. The error occurs in the operations of addition, subtraction, and multiplication by using negative numbers.

Miftaqul Janah (2012) concluded that the error in calculating this because students are less accurate in the calculation, students sometimes enter the wrong numbers into the formula used. There are also students who dalah in doing so in the process of multiplication operations into one.

4. CONCLUSION

Errors made by students in the matrix material may be grouped ie mathematical communication an error, an error to apply the formula, and an error count.

Based on the results of data analysis and discussion of the students obtained errors in solving problems of the matrix are as follows:

1. Mathematical communication error committed by the student in the problem matrix is relatively low at 22%. In this error students only write data without any explanation for the data. In addition, students are mistaken in writing about the operation in question as a matter of multiplication operations into division and vice versa.
2. Error applying formula undertaken by students in question is classified matrix that is equal to 50%. In this error students make the mistake of applying the formula in the settlement. Where the formula used is not appropriate to resolve the matter and writing a formula that is still wrong.
3. Error when calculating performed by the students in the problem matrix is classified in the amount of 51%. In this error students make mistakes when calculating. Mistakes are often made of students are not mastering operations that use negative numbers. Lack of mastery of the material number operation in solving a major cause of the error.

Bedasarkan hasil wawancara terhadap siswa didapat faktor – faktor yang menjadi pemikiran dibalik kesalahan yang dilakukan siswa dalam menyelesaikan

soal – soal matriks kelas X AK SMK Prawira Marta Kartasura, adapun faktor – faktornya sebagai berikut:

Based on the results of interviews with students obtained factors are thought to be behind errors made students in solving problems of matrix in class X AK SMK Prawira Marta Kartasura, while the factors as follows:

1. Students do not understand the questions well. This is because students are always in a hurry in resolving the problem.
2. Students do not understand very well the concept that will be used. This is because students are still not mastered the material matrix so that students become confused when work on the problems.
3. The student has not mastered the number operations. This is because students can not count the number operations with negative numbers.

So many errors that occur at the time an error count. Error when counting is done by the students in problem is classified matrix that is equal to 51%. This mistake is often made that the student has not mastered operation using negative numbers.

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