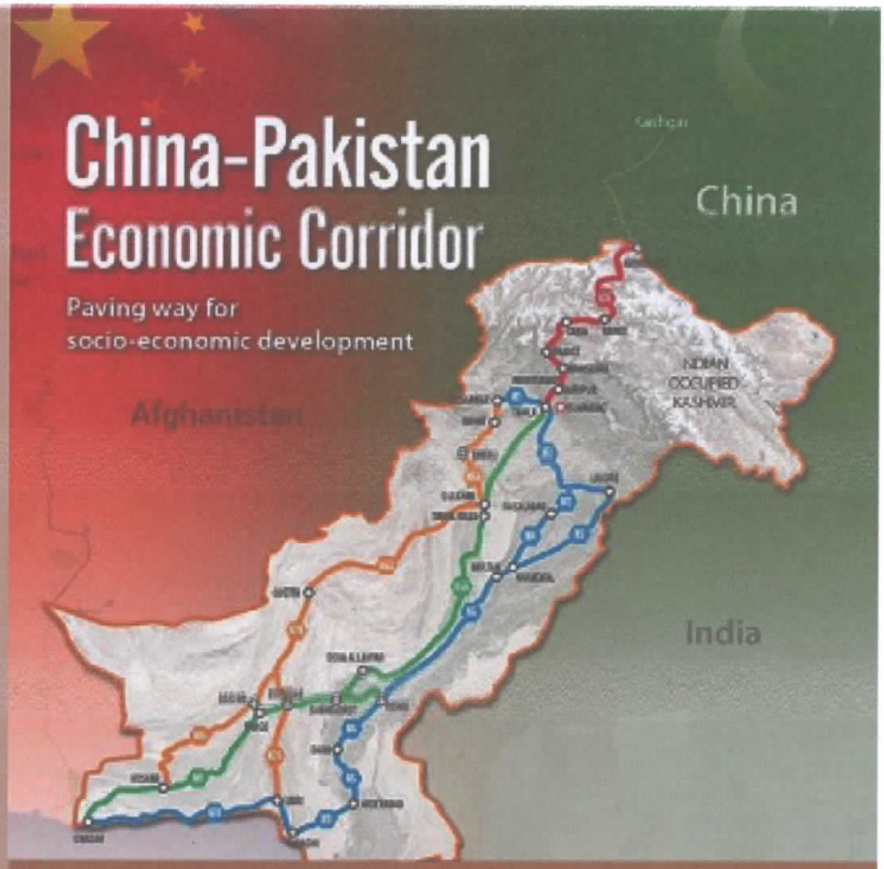

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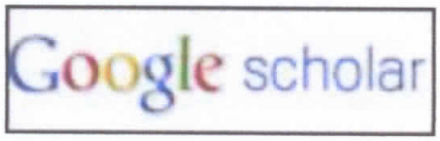
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JOURNAL CONTENTS

ANALYSIS OF STUDENTS' MATHEMATICS REASONING WHEN SOLVING STORY TASKS

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ABSTRACT

This study is conducted to analyze in depth the reasoning of students' mathematics in solving story tasks. The approach is qualitative with case study-type. The subjects are 6 students of senior high school grade XI; 2 students of high classification, 2 students of medium classification and 2 students of low classification. Data collection methods are in the form of story and interview questions. The results show: 1) Students belonging to a high classification if they can meet the six reasoning indicators; present mathematical statements of both what was known and asked either in the first or second question; propose a guess by estimating the answers and the process of given solution; do mathematical manipulation; make a conclusion; provide a logical reason when not meeting several indicators; and always check every settlement step; 2) Students belonging to the middle classification also meet the six indicators, just dc not meet some indicators such as incomplete writing down what is known and not writing down what is asked primarily in the first question, having error in solving the problem for lack of understanding of the problem and not making conclusions, but can provide a logical reason when interviewed; 3) Students belonging to the lower classification do not meet some indicators, which are incomplete presenting what is known and do not present what is asked either in the first and second questions; may propose by estimating the answers and the process of the given solution but the solution process and its completion step wrong; can perform mathematical manipulations but there are errors in the process of completion, can not provide logical reasons when interviewed.

Keywords: Mathematics Reasoning, Students, Resolving tasks, Story Tasks, Mathematics

INTRODUCTION

Nowadays, the development of science and technology rapidly runs, especially in the field of telecommunications and information. As the result, the number of competition among humans to have more superior within the ever-changing circumstances. to overcome, it is required the ability to obtain, select and manage information. In addition, the ability to think critically, systematically, reasonably, logically, creatively, and can cooperate effectively (Huda & Angel, 2013, Moharom, 2014; Purnamasari, 2014)

The purpose of learning mathematics at school as referred to in regulation of national ministery of education (Permendiknas) No. 22 of 2006 on the second point, using reasoning on patterns and traits, performing mathematical manipulations in generalizing, compiling evidence, or explaining mathematical ideas and statements. Then in accordance with its development, the purpose of learning mathematics in regulation of ministry of education and culture (Permendikbud) No. 59 of 2013 is as stated in the Core Competency on the fourth point of processing, reasoning, presenting and creating in the realm of concrete and abstract

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mathematics tasks, especially for tasks relating to daily life, which is usually in the form of a matter of the story.

Story tasks is a modification of the quantification tasks in which have relevancy with the reality that exists among student environment (Wibowo, Djaelani & Sularmi, 2013, Marhayati, 2012; Lathifah, Zulkardi & Somakim, 2015; Nurussafa'at, Imam & Riyadi, 2016). Through the story, the students will get used to seeing the daily life relationship with the mathematical knowledge that has been obtained at school (Nurhayati, 2013). Mathematics Story tasks is a form of mathematical problem that contains aspects of the ability to read, reason, analyze and find solutions, for which students are required to hold the abilities in solving the math story tasks (Khasanah, 2015). The ability to solve the problem of mathematics is the intellectual ability to solve problems in which mathematical concepts are related to everyday life, and can be solved through non-routine procedures, that is understanding the problem, making plans, implementing plans and re-examining the answers (Sari, Dantes & Ardana, 2014).

The story tasks are made in the form of a sentence with the theme of problems in everyday life and demanded to be solved, and in the process of working, the student firstly have to understand the contents of the story, then draw the conclusions of objects to be solved then separates it from mathematics symbols, to the final stage of completion (Nurhayati, 2013; Nusi, Sumarno & Nurwan, 2013; Rindyana & Tjang, 2013). While processing this work, the students are required to be able to change the mathematical sentence into a mathematical symbol, for that reason math is very important. As with the results of Huda & Angel (2013) research, the story problem is very useful for the development of students' thinking process because in solving the problem required steps of settlement that require understanding and reasoning. The reasoning relationship with the story problem can be seen in Table 1 below.

Table 1. Reasoning in Solving Story Tasks

Indicator of Reasoning	Step of Answering story tasks
1. Present mathematical statement by spoken, written, picture, and diagram; 2. Filed allegations:	Understanding tasks by: a. Reading tasks; b. Repeating statement using her/his own words; c. Revealing every sentence means, what has been known and will be asked.
3. Conducting math manipulation: 4. Arranging proof, providing any reason or proof of right solution; 5. Drawing a conclusion from every statement; 6. Ensuring argument validity: 7. Finding design or feature from mathematics symptom to take generalization.	Answering tasks by: a. Creating design or mathematical sentences; b. Connecting the type of required number operation; c. Completing the mathematical sentence; d. Checking the answer to find out the true or false results; e. Filling the conclusion.

This is a case study focusing on students' mathematical reasoning and tasks of continuous storytelling, as this study examines students' reasoning when solving story tasks. Therefore, the formulation of the problem in this research is "How the mathematical reasoning of the senior high school students from grade XI while answering the story tasks ?" The purpose of this research is "to analyze the student's mathematics reasoning of grade XI Nasional Senior high school while answering story tasks.

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classification (HS), medium classification (MS) and low classification (LS). Each classification is taken two people to be subject, which then held an in-depth interview. This mathematical reasoning indicator consists of seven indicators and each indicator is analyzed and described in depth. The results, described as follows:

1. Presenting Mathematical Statements Orally, Written, Picture and Diagram

The reasoning of HS, MS and LS on this indicator are visible when they can identify what is known and asked verbally and can give an explanation that what is known and asked comes from the statement in the matter because he thinks it has been clearly written on the matter. While in writing only HS1 and MS1 complete in presenting what is known and asked. HS2, MS2 and LS are incomplete in presenting, ie not presenting what is being asked (HS2), not presenting what is known and asked (MS2 and LS1), and incomplete when presenting what is known (LS2).

2. Presenting Allegations

The Reasoning within these indicators is visible when they can predict the answers and the process of the solution through the settlement steps and able to provide a logical explanation that approximate and process of the solution are obtained when looking at what is known and asked. HS and MS can estimate the answer and the solution process by making the completion step, only the estimation and process of MS2 solution is slightly different from HS and MS1, this is because MS2 made a mistake in understanding the tasks and also does not present what is known and asked. While the approximation and process of LS solution is different from that given by HS and MS, because it does not present what is known and asked and does not understand the relation of data given.

3. Conducting Mathematical Manipulation

The reasoning within these indicators is visible when they can perform mathematical manipulations, include; providing the design of mathematical problems, providing tables of known data, visualizing data from a mathematical statement and solving mathematical problems. In general HS, MS and LS1 in the first question can manipulate, only LS1 in making graphs and-inequalities is less precise. LS2 can not take mathematical manipulation, because of lack of fulfillment of previous indicators. In the second question, HS and MS can manipulate, it's just that MS2 is not exactly in the settlement. While LS does not manipulate because the image is made less precise and less fulfilled previous indicators.

4. Preparing Evidence, Giving Reason or Evidence to the Truth Solution

The reasoning within these indicators is visible when they can compile evidence from facts and provide precise reasoning of the answers given using facts from the mathematical model form and their relation to tasks solving. HS and MS can compile the evidence and give the right reasons to both questions, only MS2 in the second question has a mistake but can provide the exact reason for identifying the data. In the first question LS1 also gives the right reasons, but in the last step does not give the right reasons, while LS2 does not compile the evidence giving the exact reason for the answer given. In the second question, LS can compile the evidence and give the exact reason for the answer given after showing the picture he has made.

5. Drawing Conclusions from the Statement

The reasoning within these indicators is visible when they can draw a logical conclusion. In the first question, HS and MS can draw a logical conclusion from the statement. LS2 can also draw conclusions from statements, but the answer is less precise, whereas LS1 does not make any conclusions. In the second question, HS2 can draw conclusions appropriately. HS1 and

of a given solution; can take mathematical manipulation; make a conclusion; provide a logical reason when not meeting some indicators such as not writing down what is asked and not making conclusions; and always check every step of the settlement.

2. Students belonging to the middle classification are the students which are also meet the six indicators, just do not meet some indicators such as incomplete writing down what is known and not writing down what is asked primarily in the first question, the error in solving the problem for lack of thorough understanding of the problem and not making conclusions, but can provide a logical reason when interviewed.
3. Students belonging to the lower classification are the students do not meet some prior indicators, ie incomplete presenting what is known and do not present what is asked either in the first and second questions; can propose a guess by estimating the answers and the process of the solution given but the solution process and its completion step wrong because of misunderstanding the problem; can do mathematical manipulation but there are errors in the process of completion, and not even make conclusions, do not check every step of the settlement and can not give a logical reason when interviewed.

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