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The effect of students' mathematics views on how they read math textbook

The effect of students' mathematics views on how they read math textbook

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Abstract: This article describes students' view in mathematics on the way they read mathematics textbook. This study is descriptive that aims to know about the affect of students' mathematical views on how they read math textbook and what is the solution that supposed to do for making the students understan the whole mathematics textbook. The population of this study is the students in ninth grade at Junior High School Bina Tama Palembang. There are two data collection techniques, those are questionnaire and interview, so the data is obtained from the results of the questionnaire distributed to students and recorded during the interview process. The results shows that the students who think that they understand mathematics when they are able to do worked exercises, and they purpose to read mathematics textbook in final is also when they do the exercises.

1. Introduction

In the process of learning mathematics, reading comprehension is important. Reading is as an active process of meaning-making in which readers use their knowledge of language and the world to construct and negotiate interpretations of texts in light of the particular situations within which they are read [1-4]. Reading strategies can help reading comprehension mathematics textbook. In reading mathematics textbooks, students will be encouraged to use definitions because mathematics textbooks often do not have many clues outside the definition itself, in this case students need to be very active in trying to understand definitions in monitoring their understanding [5].

Low learning achievement is one proof of the difficulties in student learning, the background of learning difficulties is very important. The basic problem is how students can read the mathematics textbook itself [6]. The way students look at mathematics will influence them how read math textbooks. Formal definitions are not used by students as much as drawing their concepts when reasoning about abstract ideas. This shows that reading strategies for mathematics must advocate that students are actively involved in working from their concept drawings to actual definitions, and vice versa, in order for them to achieve similar similarities reasonable of the meaning intended by the mathematics textbook [7, 8] One of difficulties in mathematics is students do not understand the definition itself.

Students' views on mathematics will have a direct impact on the learning process especially at the stages of studying textbooks. Textbooks are one of the important things that become the main support in guiding students to learn [9-11]. The purpose of students studying textbooks is to assist them in understanding the material to be learned so that during the learning process of textbooks and students have a very clear relationship [12]. A lot of useful information if when reading the textbook they use contains something interesting and not boring. This will make students enthusiastic and interested in learning in order to develop knowledge and curiosity about what they are learning [11,13]. Most of the

exercises provided in mathematics textbooks do not more than mimic the procedures in the example problems being worked out [12, 13]. Although available concepts, principles, mathematical theorems, proofs and models contained in textbooks, students tend to assume that they are learning mathematics in order to be able to do the exercises. Most learning environments such as textbooks and tests created by teachers focus on procedural algorithms without giving students sufficient opportunities to reason [14].

Based on the problems above, the right reading of mathematics textbook is needed. Therefore, this study will discribe how student's mathematical view will affect on how they read mathematics textbook and after knowing the result, the writer will give the solution that that supposed to do for making the students understan the whole mathematics textbook.

2. Method

This type of research is a descriptive study. Descriptive research aim to describe, explain and validate social phenomena that are the object of research and its characteristics [15, 16]. Descriptive research is defined as a research method that describes the characteristics of the population or phenomenon that is being studied. This methodology focuses more on the "what" of the research subject rather than the "why" of the research subject. In other words, descriptive research primarily focuses on describing the nature of a demographic segment, without focusing on "why" a certain phenomenon occurs. In other words, it "describes" the subject of the research, without covering "why" it happens. In this study, researchers will provide an overview of the affect of students' views on mathematics understanding of the stages of reading mathematics textbooks for junior high school students in ninth grade at Junior High School Bina Tama Palembang.

3. Result and Discussion

Based on Table 1. certain categories that can be made to get a percentage of the whole sample taken. The following categories are for questions 1 and question 2.

Question 1

- Category 1: Read the definitions or rules - Learn the example problems - Do the exercises
- Category 2: Learn the example problems-Read the definition or rules-Work on the exercises
- Category 3: Do the practice exercises - Learn the example problems - Read definitions or rules
- Category 4: Learn the example problems - Work on the exercises - Read the definitions or rules

Question 2

- Category 1: Understand the definition or rule
- Category 2: Able to do worked exercises
- Category 3: Understand the example problems only

Next, the following percentage of categories are obtained in questions 1 and question 2 from the average results obtained in each category.

Percentage of questions 1

- Category 1: 37.5%
- Category 2: 37.5%
- Category 3: 12.5%
- Category 4: 12.5%

Percentage of questions 2

- Category 1: 12.5%
- Category 2: 62.5%
- Category 3: 25%

Table 1. Results of questionnaires that have been conducted on ninth grade students of Junior High School Bina Tama Palembang

No.	Name	The answers of the first question (Actual Reading Mathematics Textbook Steps)	The answers of the second question (mathematics understanding)
1.	AS	1. Learn the example problems 2. Read the definitions or rules 3. Do the exercises	Understand the example problems only
2.	AF	1. Read the definitions or rules 2. Learn the example problems 3. Do the exercises	Able to do worked exercises
3.	CS	1. Learn the example problems 2. Do the exercises 3. Read the definitions or rules	Understand the example problems only
4.	DA	1. Learn the example problems 2. Read the definitions or rules 3. Do the exercises	Understand the definition or rule
5	EA	1. Read the definitions or rules 2. Learn the example problems 3. Do the exercises	Able to do worked exercises
6	MR	1. Learn the example problems 2. Read the definitions or rules 3. Do the exercises	Able to do worked exercises
7	MF	1. Do the exercises 2. Learn the example problems 3. Read the definitions or rules	Able to do worked exercises
8	RW	1. Read the definitions or rules 2. Learn the example problems 3. Do the exercises	Able to do worked exercises

3.1. Graphic data info

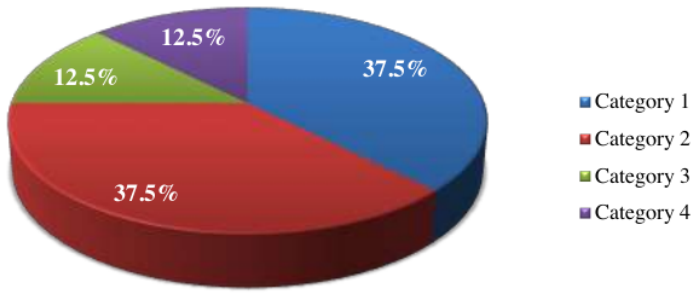

Figure 1. Percentage of results of student answers in question 1.

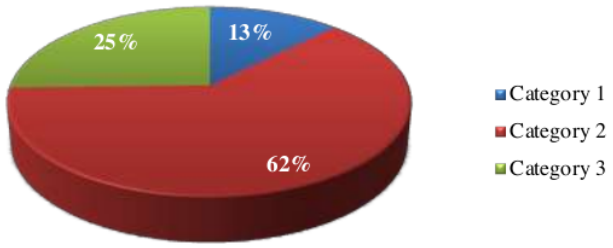

Figure 2. Percentage of results for student answers to question 2.

3.2. Data description

The description of the data that will be presented from the results of this questionnaire is to provide a general description of the data obtained in the field. The data collection was carried out at Junior High School Bina Tama Palembang with a total of 8 respondents. The data presented in the form of a questionnaire filled out by Junior High School Bina Tama students.

The data in the infographic data table contains qualitative data written by the respondent in the first question column, and quantitative data that is the number of check marks contained in the second question column. The researcher uses a questionnaire with answers that are still left blank with two different but related questions and must be filled in by the respondent with the aim that the respondent has the freedom to fill in the questionnaire.

Based on interview guidelines and questionnaires that have been used, this description consists of two things, namely students 'opinions about the stage of reading a mathematics textbook and students' perceptions of understanding mathematics. The description of each answer based on the results of the questionnaire will be explained as follows.

3.2.1. Data description of the answer from the first question (the stage of reading a correct mathematics textbook).

Based on the raw data for the answer to the first question collected from the distribution of questionnaires to 8 respondents, it can be seen the percentage of the answer data. In Figure 1, it is known that the students' answers to the first question are divided into four categories. The first and second categories averaged 37.5% with a sequence of different stages. The first category of stages filled by students is to read definitions or rules - learn example problems - do the exercises while the second category of stages filled in students is to learn examples of questions - read definitions or rules - do exercises. Then the third and fourth categories get an average of 12.5% with a sequence of different stages. The third category of stages filled by students is to do the exercises - learn examples of questions - read definitions or rules while the fourth category of stages filled in students is to learn examples of problems - do the exercises - read definitions or rules.

This shows that there is a balance between the initial stages that students do that is reading the definitions and seeing examples of questions with the final goal of students in these two categories being the same, namely doing the exercises. But at the time of the interview, something new was discovered, along with an excerpt from the interview with EA students.

P : So, what is the reason you should read the definition first in reading the book?
EA : Um, the reason is to work on the formulas first.

With the answers from EA students, this shows that it is not the actual definition students read, but the formulas that are worked out. This is inversely proportional to the interviewer's assumption about

the definition of the understanding understood by students. In addition, other students who choose based on category four, when interviewed, students look confused to show where the definition part is the student's intent and in the end does not answer the question. The following except from the interview transcript with the student.

P : Umm ... Then after that, the last one you choose the reading the definition?
CS : He umm....
P : Why does reading the definition become your last choice?
CS : Umm... why? Umm..

With this finding during an interview, this shows that students actually really do not understand the definition of the definition so that reading definitions or rules is the last choice in the stages of reading mathematics textbooks so that students do indeed only focus on the practice questions. Overall, the results of students' answers can be concluded that the stages of reading a math book that students do, ultimately has the goal so that students can do the exercises. Although they choose in the initial stage or the final stage they choose is to read the definition or rules, but in reality students do not know which part of the definition or rule is said, and students tend to look at the sample questions first and then do the exercises.

3.2.2. Data description of the answer from the second question (students' perception of understanding mathematics).
Based on the raw data for the answer to the second question collected from the distribution of questionnaires to 8 respondents, it can be known the percentage of the answer result data. In Figure 2, it is known that the students' answers to the second question about understanding mathematics are divided into three categories. The first category gained an average of 12.5%, where students chose to understand definitions and rules as the meanings of mathematical understanding. The second category obtained an average of 62.5%, where students chose to be able to do exercises as a meaning of understanding mathematics. The third category gets an average of 25%, where students can work on just example problems as meaning of understanding mathematics. Where this shows that can work on the problem as the meaning of understanding mathematics is the most choices chosen by students.

There is one student who chooses to understand the definition or rule as a mathematical understanding, but the student does not understand the definition of the definition itself. So when asked further about the question exercise, the student chose to ask the teacher the solution. The following excerpt transcript interview with these students.

P : How about if any worked exercises that more difficult?
DA : I will ask my teacher

Students assume that definitions are formulas to help them do problem exercises, when students find it difficult to work on more difficult problems, students will look for other formulas that are relevant to the problem. This can be seen from the following interview excerpt.

P : Ummm... then, how about the definition? Do you think that u should really understand about the definition?
AF : Yes, i should understand
P : What is your purpose?
AF : my purpose is being able to do the worked exercises
P : did you ever find the worked exercises that more difficult than the example question?
AF : Yes, i did
P : what did you do?
AF : I looked for another formula

Based on these data, it can be concluded that the majority of students assume that in essence students interpret mathematical understanding with their ability to do problem exercises. At the time of the interview, it was found that if students could not do exercises that were considered difficult, students would look for examples of the same problem, re-read formulas where students assumed that the formulas were definitions, or students would ask for help from the mathematics teacher . So that the final goal of students in learning mathematics is to be able to do all the exercises. With this, if students are able to do all the exercises, students assume they already understand mathematics.

3.3. The relationship between students' views on how to read and student data infographics

In the process of learning mathematics, reading comprehension is important. Reading is as an active process of making meaning where readers use their knowledge of language and the world to construct and negotiate interpretation of texts in the light of the particular situation in which they are reading [1-4]. Reading strategies can help reading textbooks understanding mathematics. In reading mathematics textbooks, students will be encouraged to use definitions because mathematics textbooks often do not have many clues outside the definition itself, in this case students must be very active in trying to understand definitions to monitor their understanding.

In the other hand, based on infographic data that has been obtained students are more focused on being able to do the exercises and are not sure that they can do all the exercises and still ask the teacher for help if the questions are too difficult. Not only that, students also have a wrong perception about the definitions that have been learned. Students assume that definitions are meanings and formulas to help answer practice questions. This causes them to only focus on numeracy skills without understanding mathematical concepts in the material that must be mastered before they can do the exercises. This results in students only answering simple routine questions, focusing on routine questions makes students difficult if they find questions that are more difficult to do. Students will experience confusion that makes them lazy to answer questions, so their mathematical abilities will be very limited. With gaps that occur in students who only focus on practice questions, where students must be able to understand mathematical concepts. The limitations of textbooks in containing matters relating to understanding and reasoning make students tend to be difficult to solve problems related to real life [13].

One solution is to make practice questions into questions that make students reasonable and of course the practice questions are not routine exercises done by students at school. This requires teaching staff to be able to give questions to students which makes them reasonable in finding solutions. For solving various types of mathematical problems and in various domains of mathematics, as well as being able to analyze and evaluate in finding solutions to problems independently, students need problems that are not routine so that their views of mathematics match what they should [17]. This goes hand in hand in one of the studies that says the definition of the state of reasoning is a concept of mathematical ability that requires five interrelated pathways and influences conceptual understanding, including covering concept understanding, strategic competence, namely the ability to formulate, represent, and solve mathematical problems; mathematical operations and relationships; procedural fluency involves skills in carrying out procedures and is flexible, accurate, efficient, and precise; adaptive reasoning, which is the capacity of logical thinking, reflection, explanation, and justification; and productive dispositions, orientation to see mathematics as common sense, useful, useful and anyone can give reasons to understand mathematical ideas [18, 19].

Therefore, the teacher should provide a solution so that it can help students to develop their understanding and reasoning skills by providing exercises that are sourced from different problems [15]. So that when looking for problem solving from the exercises given students can involve all the stages that exist in mathematics including the application of mathematical concepts and skills in a variety of situations including non-routine problems [20].

4. Conclusion

In interpreting mathematical understanding, students assume that being able to do exercises in math textbooks is the final goal in learning material in mathematics. In understanding the definition of a material, according to students the aim is to be able to do the exercises. The meaning of definition

according to students is the formulas used to make them able to work on problems. With this gap, educators can develop exercises that can require students to look for problem solving from exercises given to students that can involve all the stages in mathematics including the application of mathematical concepts and skills in a variety of situations including non-routine problems.

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