

IDENTIFICATION OF ERROR IN MATHEMATIC CONCEPTS AND ITS REPAIRMENT ON THE TEACHER'S AND STUDENT'S BOOK OF 1ST GRADE TO UNDERSTAND THE RIGHT CONCEPTS OF MATEMATICS FOR CHILDRENS

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Abstract

Based on the regulation No. 71, 2nd verse in year 2013 administered by the Prime Minister of Education and Culture, it is known that using a handbook for teachers and students are started on 1st to 6th grade in Elementary school. The handbook is needed to apply the thematic learning for teacher and the student's handbook is applied as a guide book and practice book to help the students to get involved in thematic learning. The teachers' and students' books, contain a mathematic concepts which is included as a part of the thematic learning. If the 1st grade in Elementary school has appropriate understanding of Mathematic concepts, the result will be fundamental to the understanding concepts for the next grades. Along with this case, the error on Mathematic concept in both handbooks will cause an error understanding concept for the students. Additionally, teachers and students will get the difficulties to understand or develop wider concept. According to the above explanation, this paper will elucidate the result of error analysis in mathematic concept in teachers and students handbook of 1st grade Elementary school and how to improve it. The improvements are required to help the teachers and students in improving the quality of the book and developing better mathematic concepts.

Key words: error identification, mathematic concept, teachers' handbook, students' handbook, repair on error.

INTRODUCTION

2013 curriculum has been established for primary education (SD) or same level (MI) since 2013/2014 academic year. In the implementation of this curriculum, a lot of schools in the city or district in Indonesia are not concern to 2013 curriculum. Based on the regulation No. 160/2014 on the implementation of 2006 and 2013 curriculum administered by the Prime Minister of Education and Culture cited that a unit of primary and secondary education who established 2013 curriculum since the first semester of 2014/ 2015 academic year back implement 2006 curriculum starts from the first half of the second 2014/ 2015 academic year until for a word from the ministry to implement 2013 curriculum. Whereas, there are a lot of primary and secondary education implement 2013 curriculum mainly in Malang due to they refer to the

implementation of 2006 curriculum which is implemented until 2019/2020 academic year (Kemendiknas, 2014).

The implementation of 2013 curriculum in basic education in Indonesia refers to the text book (students' book) and teacher guide book. It is based on the *Permendikbud* regulation No.71 verse 2 year 2013 on learning text book and teacher guide book for primary and secondary education. There are guides for teachers in implementing the learning for all subjects in the teacher's guide book including mathematics. It has the facts, concepts, principles and skills of abstract mathematics. Correct understanding mathematical concepts at an early stage will determine the further understanding of abstract mathematical concepts.

Based on previous study conducted by Ekowati (2014) on the analysis of the

mastery of mathematical concepts in thematic learning class 1 MI Nurul Islam Tajinan Malang shown that the implementation of mathematical concepts in MI have been done in four levels, namely concrete, identity, classificatory and formal. On the first level, concrete, examples that have experienced previously introduced to the students. On the second level, identity, students recognize previously encountered examples although an example "observing from the perspective of space and time are different or perceived in a different assumption". On the third level, classificatory, students can distinguish between examples and not examples. On the fourth level, formal, students can explain a definition of those concepts. On the teaching and learning process, the result of observation showed an error on the second level, identity. The students are less able to recognize previously encountered examples though examples "observing from the perspective of space and time are different or perceived in a different assumption". The condition affects the fourth level, formal, students able to explain a definition of mathematical concepts. Only two students could show the understanding of the fourth level. And this level did implicitly. The result of interview by Ms. FM, a class room teacher, showed that the learning activity done by the teacher and student book as the guidance. Therefore, the quality of the teacher and student books directs teachers to implement the concept correctly.

Errors in teachers' and students' handbooks need to be analyzed, so that we get an overview of conceptual errors and how to improve it. The errors concept in a teacher's and student's handbooks make the students getting misinterpretation and find the difficulties in developing and comprehend the concept itself. Therefore, the research about mathematic concept on the handbook based on curriculum 2013 is required to detail examination to stimulate the students be more comprehend in mathematic concepts correctly.

RESEARCH PURPOSES

The purpose of this research is to

describe and rectify misconceptions by examining the contents of the handbooks objectively and systematically. Teachers' handbook which used for the object of analysis is teacher's and student's handbooks from the Prime Ministry of Education and Culture which published in 2013. The errors disclosure on the mathematic concepts is inaccuracy concept. The errors of mathematic concept may include some errors which define the concept, the fault in distinguishing between the examples and not the examples of the concept, inappropriate definition of illustration concept which is given, inaccuracies or incompleteness in revealing the whole discourse, and the use of anonymous concept or inconsistent.

RESEARCH METHOD

The method used is a qualitative research method by using descriptive research design. The procedure of this research is reading books; those are teachers' and students' handbooks on the first grade of the second semester. The error described based on the error in defining the concept, inappropriate definition of illustration concept which is given, inaccuracies or incompleteness in revealing the whole discourse, and the use of anonymous concept or inconsistent. Then, the data which obtained are classified. The next step is described the errors concept and repair it.

The sources of the data in this study are teachers' and students' handbooks on the first grade of the second semester which published by Prime Ministry of Education and Culture in 2014. The data analysis was limited to the teachers' handbook and a book which obtained during the activity of analysis. Before analyzing the data, firstly, we need to describe about errors in mathematic concepts. The analysis used is descriptive analysis.

RESULTS AND DISCUSSION

Some steps of the research: (a) examine all existing data in teachers' and students' handbooks. Teachers' handbook used to facilitate the teachers in implementing the learning process and

students' worksheet (*LKS*) is existed on the student's book. (Teachers' handbook (SD/MI) of the first grade in 2014). The results of this understanding is in the form of a data description; (b) transcribing the error data of mathematic concepts in teachers' and students' handbooks; followed by (c) verifying (conclusion) of the data that have been classified and transcribed on the presentation/exposure of the data; (d) Furthermore, the researchers deliver its preparation. In the following explanation are the result of the error analysis and its preparation of mathematic concepts in teachers' and students' handbooks of the first grade of the second semester.

1. Errors in defining the concept

Indicators: Errors in using symbols/table/diagram

In theme 6, subtheme 1, lesson 2, there is an error in giving a symbol of mathematic concept. The symbol used is the "plus", "equal" word in the math sentence. Improvement is "and" should be + (plus), and "become" should be = (equals). In Indonesian "and", "become" is as conjunctions, in which the function is to connect two sentences or more equal position. (Abdul Chaer, 2008: 98). So, the use of mathematic symbols is different from the use of conjunctions. Conjunction is only used in a sentence, not for math operations.

Indicators: Incompleteness is define the concept

In theme 7, Subtheme 1, Lesson 3, there is an error of mathematic concepts; incompleteness in defining the concept. The concept itself is the multiples concept. In one of exercises there is not an explanation or examples to the number multiples line of 2 and 3. On the other hand, students on the 1st grade are still at the stage of concrete operations. Therefore, the improvement is the explanation or material about multiples numbering. Multiples numbering are the product of those numbers with the count numbers. Working on multiple numbering using a number line; the students skip to count by 2-by-2 using a number line and ongoing by 3-by-3 on the same number line.

(Karim, 1997: 79).

2. Errors in differentiate the examples and not examples

Indicators: An example of not using symbols / tables / diagrams correctly

In the theme 6, sub-theme 1, lesson 4 and theme 7, subtheme 1, lesson 6, is not using the correct symbol. In one of the examples above, there is a subtracting operation using a picture. In the picture above do not illustrated the reduction operation which indicates the number of images. According to David Pimm (Rubenstein and Thompson: 2001), the function of mathematic symbols is to describe the structure of mathematics by understanding mathematic symbols, it will be more comprehensive widely. On the other hand, based on the same questions which related to the symbol of reduction are illustrated through pictures. In the figure, the reduction symbol is depicted in the form of crossed images.

3. Errors in illustrating a definition

Indicator: incomplete illustrations to convey concepts

In the theme 6, subtheme 1, lesson 2, incomplete illustrations to convey concepts i.e. there is not a clarification that 41 is the result of sum of 21 and 20. Improvements on the caption; should be added to the sentence clearer to work on the problem underneath. An illustration of the mathematic is used to make the problems be easier to digest. This is one of good basic worksheets. Therefore, a comprehensible illustration is helpful to ease the students in working mathematic problems.

4. Incorrectness and incompleteness in revealing the universe of discourse

Indicator: the universe of discourse is incomplete

In the theme 5, subtheme 4, lesson 6, there is not a material about simply measuring the length, and width. Students learn about tiling. While the early material about the length and width, recently introduced in 3rd grade (Curriculum 2013 in

2014). Improvement by providing material about measuring the length and width are simple. Another alternative is the turn of the "long", and the width word of the term tiling.

Moreover, in the theme 7, subtheme 1, lesson 3, there is an error in the mathematic concept i.e. it is not accompanied by examples of counting using the number of multiples line of 2 and 3. Improvements in these exercises need to be equipped with a sample math settlement. Should to know some points in solving the math problems; understanding the problems, planning the settlement, settling the problem as the plan, and recheck (Bahri, 2010).

5. Misapplication of anonymous or inconsistent concept used in the books teachers.

Indicator: the written concept is known yet

In theme 6-7, subtheme 1-2, lesson 2 or 6, using "plus", "equal" word in operating math. Improvement by replacing "plus", "equal" word with the symbols "+", "=". Conversely, in the SKL part of the teachers' handbooks is using "+" in the sentence. Improvement of the errors above is replacing the symbol "+" with the "plus" word. The word "plus", "equal", is a kind of coordinating conjunctions that connect two parallel clauses (Abdul Chaer, 2008:98).

An error explanation above is the result of objectively and systematically examination of the contents of the teacher and student handbooks. The error concept in the handbooks slows the students in the 1st grade down in learning the mathematic concept correctly. The obstacle may be realized or not by people who experienced in the process to attain the result of the study. Consequently, the foundation of understanding concept achieves will affect the mindset for the next grade. Johnson and Rising in Sabrina (2006:1) stated that math is a mindset, argues that mathematics is a thought pattern, a verification pattern in organizing logic, a knowledge to organize the structure properties, theories, deductively based on the elements that are not defined, axioms, or theory that has been proven to be true.

Thus, we can conclude that

mathematics is a scientific abstract, which requires an accurateness to learn it as a medium of systematic logically thinking, logic, and criticize to use the mathematic language. By using a math, others science may develop rapidly because the math can come into the territory of other branches of science and all aspects of human life.

CONCLUSION AND SUGGESTION

From the analysis and discussion that has been described in previous chapters, it can be concluded among other things, there are five types of errors contained in the mathematic concept of teachers' and students' handbooks, among others: 1). Error defines the concept, indicators: errors using symbols/table-/diagram, has two errors. Indicators: incompleteness defines the concept, having 1 error. 2). Errors differentiate examples and not an example, indicators: the example does not use symbols/tables/diagrams are correct, having 2 errors. 3) Errors in illustrating a definition, Indicator: incomplete illustrations to convey concepts, having 1 error. 4) Incorrectness and incompleteness in revealing the universe of discourse, Indicator: the universe of discourse is incomplete, having 2 errors. 5) Misapplication of anonymous or inconsistent concept used in the books teachers, Indicator: the written concept is known yet, having 1 error.

Improvements conducted by researchers in mathematic concepts namely: 1) Use mathematic symbols correctly. Replace the word "and" should be "+" (plus), the word "become" should be "=" (equals). 2) To give an explanation or material on multiples numbering. 3) Giving a reducing operation on the matter and pictures are used in a reducing operation or can also use a cross (x) in the image. 3) Completing the sentence in accordance with the clear instructions about the workmanship. 4) Complementary material about the length, width, or replace the term simply tiling. 5) To complete the example of settlement of mathematics.

REFERENCES

Arikunto, Suharsimi.2010. *Prosedur*

Penelitian Suatu Pendekatan Praktik.
Jakarta : Rineka Cipta

Amri, Sofan.2013. *Pengembangan dan Model Pembelajaran dalam Kurikulum 2013.* Jakarta : Prestasi Pustakaraya

Mulyasa.2013 *Pengembangan dan Implementasi Kurikulum 2013.* Bandung : PT. Remaja Rosdakarya

Nina. 2014. Jenis-jenis Kesalahan dalam Menyelesaikan Soal Matematika. <https://ninamath.wordpress.com> diakses tanggal 26 November 2015

Pitadjeng.2010. *Pembelajaran Matematika yang Menyenangkan.* Jakarta: Depdiknas

Panduan Teknis Kurikulum 2013. <http://www.academia.edu>. diakses tanggal 26 November 2015

Permendikbud No. 65 th 2013 tentang standar proses pada kurikulum 2013. Depdikbud RI. 2013

Permendikbud Nomor 160 Tahun 2014.
Kementrian Pendidikan dan Kebudayaan Republik Indonesia

Ekowati, Dyah. 2014. Analisis Penguasaan Konsep Matematika Dalam Pembelajaran Tematik Terpadu Kelas 1 MI Nurul Islam Tajinan Kabupaten Malang

Permendikbud no 71 pasal 2 th 2013 tentang buku teks pelajaran dan buku panduan guru untuk pendidikan dasar dan menengah