MATHEMATICS SKILLS ASSESSMENT BASED ON THEMATIC CURRICULUM 2013 FOR STUDENTS IN ELEMENTARY SCHOOL

Dea Novitasari[a], Vairuz Meutia[b], Suhendar[c]

[abc]Universitas Pendidikan Indonesia, Indonesia
E-mail : deanovitasari04@gmail.com

Abstract: The purpose of this research is to identify and monitor the progress of the students' development of mathematics skills as the basis for learning programs that match the capabilities, constraints, and the needs they have. The research method used is descriptive method with qualitative approach with Cross sectional or One-shoot design, where this research was performed with data collected only once during a certain period of time in order to answer the research question. The participants and place in this research are third-grade students in Islamic Elementary School of Ibnu Sina in Bandung city with 46 students. The data collection techniques used is interview, observation, and test. The research instrument used is test item of mathematics skills with material from third-grade, second-grade, and first grade which was developed by the researchers based on a thematic curriculum 2013. The research results showed that, out of 46 students found 5 students who have mathematics skills' barriers. The capabilities, constraints, and the needs in each students are different, but the research results shows that the sequence of aspects mathematical skills that are difficult to understand for students is the concept of time aspect, problem solving of the word problems aspect, computation aspect, geometry aspects, the concept of money aspect, and number fact aspect. The researchers suggested to the teacher that mathematics skills assessment results can be used as reference to create a learning program that fits the needs of students and can be considered in determining the completeness criteria ratings mathematics.
Keywords: Mathematics skills assessment, thematic curriculum 2013, students in elementary school.

INTRODUCTION

Along with the times, the assessment becomes a very important thing, especially in education. Learning activities are conducted at the school so much easier if we do the assessment process before. Assessment is seen as a systematic effort to determine the capabilities, constraints and needs of students in specific areas where the data on the assessment results can be used as an ingredient in the preparation of individualized education program. Assessment can help teachers in making decisions about the needs of students in the class. This is in line with the opinion of Anthony J. Nitko (in Uno & Koni, 2012, p. 1), which states that the assessment is a general term that is defined as a process for obtaining information used in order to make decisions about students, curriculum, programs, and educational policies, methods or other educational instrument by institution, organization or official institution that organizes a specific activity.

One of the assessment can be performed on students in the classroom is the assessment in mathematics. Mathematical terms is not just an arithmetic terms because the real science of mathematics is the study of the entire arrangement of numbers and their relationship, while the operation of the arithmetic calculation is taught in schools (Delphie 2009, p. 2).

Mathematics skills assessment includes quantitative assessment and qualitative assessment.

Quantitative include arithmetic operations, while qualitative include geometry, measurement and word problems. Mathematics learning more use the numbers, so this is the cause of mathematics to be so difficult for students.

The students in elementary school generally had difficulty in reduction, computation, place value and the lack of understanding of basic calculations. Though all of these aspects is most basic in mathematics. Based on this, the much needed skills of teachers in providing treatment and special services for students who are suspected of having difficulty mathematics to determine the capabilities, constraints, and needs through assessment of mathematics skills.

METHOD

The research method used is descriptive method with qualitative approach with Cross sectional or One-shoot design, where this research was performed with data collected only once during a certain period of time in order to answer the research question (Noor, 2011, hlm. 111). The participants in this research is third-grade students with the number 46, which consists of two classes A and B. The place of this research is in Islamic Elementary School of Ibnu Sina in Bandung city.

The data collection techniques used is interview, observation, and test. The research instrument used is

test item of mathematics skills with material from third-grade, second-grade, and first grade which was developed by the researchers based on a thematic curriculum 2013.

This research was done in three stages of implementation, namely the stage I assessment identification and confirmation of the assessment which did in the classical using mathematics skills test instrument of third-grade and observation instruments. Then in the second stage further assessment was done individually using mathematics skills test instruments and instrument seconde-grade observations will be conducted on students who were netted in stage I of the instruction levels and frustration levels category. Whereas in stage III follow-up assessment which did individually using mathematics skills test instrument first-grade and instrument observations will be conducted on students who were netted in stage II with instruction levels and frustration levels category.
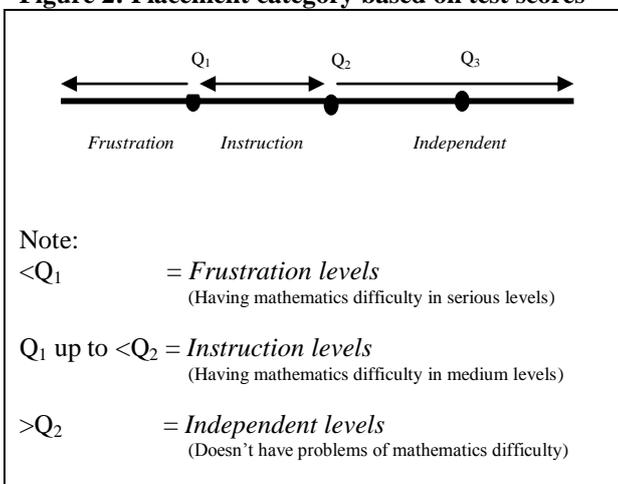
Determining score test results can be formulated as follows.

Figure 1: Assessment test results

$$Score = \frac{the\ number\ of\ earned\ score}{the\ maximum\ score} \times 100$$

The score of test results obtained by the students will then be distributed into categories of assessment results with the independent levels, instruction levels, and frustration levels category. Values category placement assessment results obtained based on student test scores are distributed in quartile value calculation can be described as follows.

Figure 2: Placement category based on test scores

Note:
$<Q_1$ = *Frustration levels*
(Having mathematics difficulty in serious levels)

Q_1 up to $<Q_2$ = *Instruction levels*
(Having mathematics difficulty in medium levels)

$>Q_2$ = *Independent levels*
(Doesn't have problems of mathematics difficulty)

Students who classified into the frustration levels category, it can be said that the student has mathematics difficulty in serious levels. Meanwhile, if the student classified into the instruction levels category, it can be said that student has mathematics difficulty in medium levels. Furthermore, if students classified into the independent levels category, it can be said that the student doesn't have problems of mathematics difficulty.

RESULTS

In the stage I of the assessment activities carried out assessment of identification which did in the classical using of test instruments third-grade 1st semester materials and instruments of observation, found the following results.

Table 1: Results of a stage I assessment identification test in Class A

Class (A) 24 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	6 studens	4 studens	14 studens
	Follow-Up	**Follow-Up**	**Finish**

The table above summarizes the results of the test stage I assessment identification mathematics skills using third-grade 1st semester materials. Based on the table, it can be seen that in class (A) the number of students 24 people, there are 6 students classified in the frustration levels category, 4 students classified in the instruction levels category, and 14 students classified in the independent levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up in the form of further tests confirm the stage I of the assessment, it can be concluded that the number of students will take the test stage I confirm the assessment as many as 10 people.

While in class (B) the number of students 22 people, there are 6 students classified in the frustration levels category, 5 students classified in the instruction levels category, and 11 students classified in the independent levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up in the form of further tests confirm stage I of the assessment, it can be concluded that the number of students will take the test stage I confirm the assessment as many as 10 people. This situation can be illustrated in the table below.

Table 2: Results of a stage I assessment identification test in Class B

Class (B) 22 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	6 students	5 students	11 students
	Follow-Up	**Follow-Up**	**Finish**

Later in the stage I assessment confimation activities performed in the classical using of test instruments third-grade 1st semester materials and instruments of observation. Stage I assessment confirmation followed by students who netted stage I assessment identification, this is done to determine whether the students really or did not experience obstacles in the subject matter of mathematics third-grade 1st semester materials. Based on the activity data found as follows.

Table 3: Results of a stage I assessment confirmation test in Class A

Class (A) 24 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	3 students	-	7 students
	Follow-Up	**-**	**Finish**

The table above summarizes the results of the test stage I confirmation assessment mathematics skills using third-grade 1st semester materials. Based on the table, it can be seen that in class (A) the number of students 24 people, there are 3 students classified in the frustration levels category, and 7 students classified in the independent levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up stage II in the form of further tests, it can be concluded the number of students of class (A) allegedly subjected to mathematical constraints on the third-grade 1st semester materials as many as 3 out of 24 people.

While in class (B) the number of students 22 people there are 2 students classified in the frustration levels category, and 9 students classified in the independent levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up stage II in the form of further tests, it can be concluded the number of students of class (B) allegedly subjected to mathematical constraints on the third-grade 1st semester materials by 2 people. This situation can be illustrated in the table below.

Table 4: Results of a stage I assessment confirmation test in Class B

Class (B) 22 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	2 students	-	9 students
	Follow-Up	**-**	**Finish**

In the assessment activity stage II which did individually using observation instruments and instruments of test second-grade 1st and 2nd semester materials. Stage II assessment is followed by advanced students who netted at the test stage I confirmation assessment. After the assessment stage II were conducted, it was found the following results.

Table 5: Results of a stage II follow-up assessment test in Class A

Class (A) 24 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	2 students	1 students	-
	Follow-Up	**Follow-Up**	**-**

The table above summarizes the results of the test stage II follow-up assessment mathematics skills using second-grade 1st and 2nd semester materials. Based on the table, it can be seen that in class (A) the number of students 24 people, there are 2 students classified in the frustration levels category, and 1 students classified in the instruction levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up in the form of advanced stage III tests, it can be concluded that the number of students suspected of having a mathematical constraints on the second-grade 1st and 2nd semester materials as many as three people.

While in class (B) the number of students 22 people there are 2 students classified in the frustration levels category. Students who classified in the instruction levels and frustration levels category will be given a follow-up in the form of advanced stage III tests, it can be concluded that the number of students suspected of having a mathematical constraints on the second-grade 1st and 2nd semester by 2 people. This situation can be illustrated in the table below.

Table 6: Results of a stage II follow-up assessment test in Class B

Class (B) 22 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	2 students	-	-
	Follow-Up	**-**	**-**

In the assessment activity stage III follow-up assessment which did individually using the instruments of observation and instruments of test first-grade 1st and 2nd semester. Stage I assessment is followed by advanced students who netted in the stage II further assessment. After the assessment stage III conducted, it was found the following results.

Table 7: Results of a stage III follow-up assessment test in Class A

Class (A) 24 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	-	1	2
	-	**Finish**	**Finish**

The table above summarizes the results of the test stage III follow-up mathematics skills assessment using first-grade 1st and 2nd semester materials. Based on the table, it can be seen that in class (A) the number of students 24 students is 1 student classified in the instruction levels category. At this stage the students who classified in the instruction levesl and frustration levels category will not be given a follow-up in the form of further tests, here the researchers will analyze what form barriers experienced by students.

While in class (B) the number of students 22 people there are 2students classified in the independent levels category. So it can be said that no student class (B) which has a barrier mathematics on first-grade 1st and 2nd semester materials. This situation can be illustrated in the table below.

Table 8: Results of a stage III follow-up assessment test in Class B

Class (B) 22 students	Category		
	Frustration Levels	*Instruction Levels*	*Independent Levels*
	-	-	2
	-	**-**	**Finish**

After carrying out a series of research activities ranging from stage I to stage III, the researchers formulate mathematical skills profile of students who opted into the activities of stage II and stage III. These profiles are plotted on a graph, where each graph depicts the profile of each student.
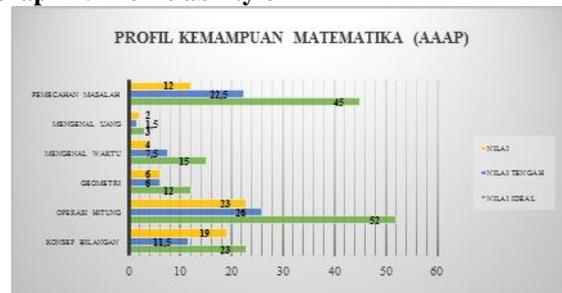
At the student with the initials name MDG, the ability of mathematics skills that he has a concept of numbers, arithmetic operations, geometry, knowing the money, and perform problem solving on word problems. It can be seen based on the value obtained exactly at the point even past the point value of the center. As for the obstacles that lie in its familiar concept of time. This can be illustrated in the chart below.
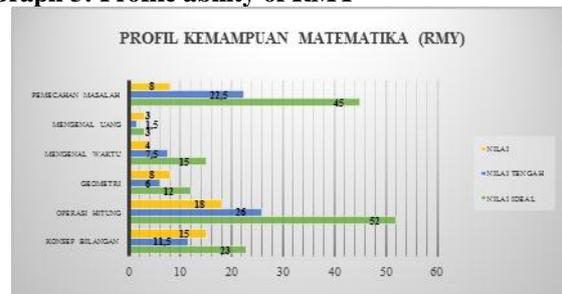
Graph 1: Profile ability of MDG
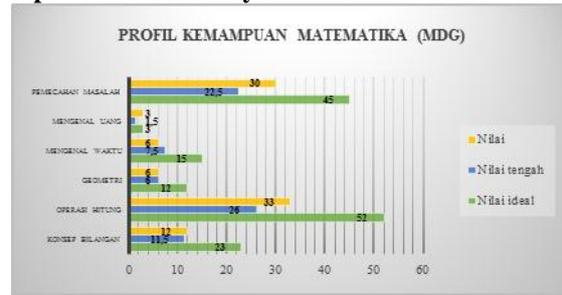
Then the student with the initials name AAAP, the ability of mathematics skills that he has a concept of numbers, arithmetic operations, and geometry. It can be seen based on the value obtained exactly at the point even past the point value of the center. As for the obstacles that lie in its familiar concept of time, recognize the concept of money, and perform problem solving on word problems. This can be illustrated in the chart below.

Graph 2: Profile ability of AAAP

Furthermore, the student with the initials name RMY, the ability of mathematics skills that he has a concept of numbers, geometry, and know the money. It can be seen based on the value obtained exactly at the point even past the point value of the center. As for the obstacles that lie in its ability to calculate operation, recognize the concept of time, and perform problem solving on word problems. This capability can be illustrated in the chart below.
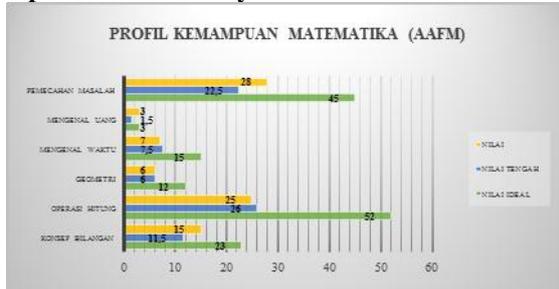
Graph 3: Profile ability of RMY

Then the student with the initials name AAFM, the ability of mathematics skills that she has a concept of numbers, geometry, knowing the money, and perform problem solving on word problems. It can be seen based on the value obtained exactly at the point

even past the point value of the center. As for the obstacles that lie in its ability to calculate operation and recognize the concept of time. This capability can be illustrated in the chart below.

Graph 4: Profile ability of AAFM

While the student with the initials name MRW, the ability of mathematical skills that he has a concept of numbers, arithmetic operations, and know the money. It can be seen based on the value obtained exactly at the point even past the point value of the center. As for the obstacles that lie in its geometry, know the time, and perform problem solving on word problems. This capability can be illustrated in the chart below.

Graph 5: Profile ability of MRW
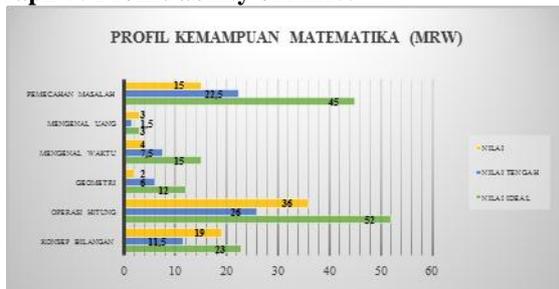
DISCUSSION

After doing a whole series of activities ranging assessment start from stage I screening and identification up to stage II implementation of assessment includes identification test stage, confirmation test stage, and follow-up assessment tests, the following researchers will conclude about the capabilities of mathematics skills in third-grade students of elementary school.

The ability of MDG's mathematics skills that he has a concept of numbers, arithmetic operations, geometry, knowing the money, and perform problem solving on word problems. As for the obstacles that lie in its familiar concept of time. Based on the placement of the value category assessment mathematics skills, it can be seen that the third-grade 1st semester materials capability mathematics skills of MDG is in the frustration levels category (having mathematics difficulty in serious levels), then on the second-grade 1st and 2nd semester materials capability mathematics skills of MDG is the instruction levels category (having

mathematics difficulty in medium levels), then on the first-grade 1st and 2nd semester capability mathematics skills of MDG is in the independent levels category (doesn't have problems of mathematics difficulty).

The ability of AAAP's mathematics skills that he has a concept of numbers, arithmetic operations, and geometry. As for the obstacles that lie in its familiar concept of time, recognize the concept of money, and perform problem solving on word problems. Based on the placement of the value category assessment mathematics skills, it can be seen that the third-grade 1st semester materials capability mathematics skills of AAAP is in the category frustration levels (having mathematics difficulty in serious levels), then on the second-grade 1st and 2nd semester materials capability mathematics skills of AAAP is in the frustration levels category (having mathematics difficulty in serious levels), then on the first-grade 1st and 2nd semester capability mathematics skills of AAAP is in the independent levels category (doesn't have problems of mathematics difficulty).

The ability RMY's mathematics skills that he has a concept of numbers, geometry, and know the money. As for the obstacles that lie in its ability to calculate operation, recognize the concept of time, and perform problem solving on word problems. Based on the placement of the value category assessment mathematics skills, it can be seen that the third-grade 1st semester materials capability mathematics skills of RMY is in the frustration levels category (having mathematics difficulty in serious levels), then on the second-grade 1st and 2nd semester capability mathematics skills of RMY is in the frustration levels category (having mathematics difficulty in serious levels), then on the first-grade 1st and 2nd semester capability mathematics skills of RMY is in the instruction levels category (doesn't have problems of mathematics difficulty).

The ability AAFM's mathematics skills that she has a concept of numbers, geometry, knowing the money, and perform problem solving on word problems. As for the obstacles that lie in its ability to calculate operation and recognize the concept of time. Based on the placement of the value category assessment mathematics skills, it can be seen that the third-grade 1st semester materials capability mathematics skills of AAFM is in the category frustration levels (having mathematics difficulty in serious levels), then on the second-grade 1st and 2nd semester capability mathematics skills of AAFM is in the frustration levels category (having mathematics difficulty in serious levels), then on the first-grade 1st and 2nd semester capability mathematics skills of AAFM is in the independent levels category (doesn't have problems of mathematics difficulty).

The ability of MRW's mathematics skill that he has a concept of numbers, arithmetic operations, and know the money. As for the obstacles that lie in its geometry, know the time, and perform problem solving on word problems. Based on the placement of the value

category assessment mathematics skills, it can be seen that the third-grade 1st semester materials capability mathematics skills of MRW is in the frustration levels category (having mathematics difficulty in serious levels), then on the second-grade 1st and 2nd semester materials capability mathematics skills of MRW is in the frustration levels category (having mathematics difficulty in serious levels), then on the first-grade 1st and 2nd semester capability mathematics skills of MRW is in the independent levels category (doesn't have problems of mathematics difficulty).

Seeing the capabilities and constraints of each student, it can be concluded that the sequence of aspects of mathematical skills that are difficult to understand for students is the concept of time aspect, problem solving of the word problems aspect, computation aspect, geometry aspects, the concept of money aspect, and number fact aspect.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The research results showed that, out of 46 students found 5 students who have mathematics skills' barriers. The capabilities, constraints, and the needs in each students are different, but the research results shows that the sequence of aspects mathematical skills that are difficult to understand for students is the concept of time aspect, problem solving of the word problems aspect, computation aspect, geometry aspects, the concept of money aspect, and number fact aspect.

Based on these results it can be concluded that the ability of MDG's mathematics skills is in the first-grade 2nd semester, and the ability of AAAP's mathematics skills is in the first-grade 2nd semester, then the ability of RMY's mathematics skills is in the first-grade 1st semester, then the ability of AAFM's mathematics skills is in the first-grade 2nd semester, while the ability of MRW's mathematics skills is in the first-grade 2nd semester.

Recommendations

The researchers suggested to teachers to be more sensitive to the existing problems in the field, especially on the subject matter of mathematics in third-grade of elementary school. This mathematics skills assessment results can be used as a reference for teachers to create learning programs appropriate for the needs of students. Teachers should be more cooperative in exploring the latest study materials from the source. In addition, the results of this mathematics skills assessment can be considered to determine the completeness criteria assessment in mathematics third-grade of elementary school.

The researchers suggested to the school that mathematics skills assessment results can be used as the gold standard for the school when the assessment mechanism as mathematics can be applied in elementary school system. In addition, the assessment results of mathematical skills can also enrich the source of the findings in the schools so they can develop a wider back to recent studies and accurate. Then this mathematics skills assessment results can be used as a model example if other subjects will implement a system of assessment of skills such as mathematics courses this. Schools can develop quality in terms of both program quality and competence of teachers in understanding the assessment of subjects with training. Schools need to add media facilities and other supporting facilities to improve the quality of the quality of teachers and students.

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