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The ability of seventh-grade disabilities students in solving number operation problems

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Abstract. This study aims to determine the ability of seventh-grade disabilities students (mental retardation) in solving number operation problems including addition, subtraction, multiplication, and division of natural numbers at SLB Bhakti Kencana I Berbah. The research method used is descriptive research to see the abilities and activities of students in solving number operation problems given by a researcher. The instruments of this study are a video to see students' processes, test questions to see students' abilities, and interviews with a teacher to encourage the student prior knowledge. The results of this study indicate that students still have difficulties in calculating the operation of natural numbers and forget how to calculate number operation according to what the teacher learns. In addition, the teacher mentioned that difficult to teach the concept of number operation.

1. Introduction

The mentally retarded or intellectual disability is a condition of children experience neurodevelopmental disorder [1]. However, it must be remembered that behavioural disturbances experienced by students up to the age of 18 years and make it difficult to adapt to the learning situation [2]. The difficulty often experienced by mentally retarded children is not being able to filter out information that is not needed and is not relevant [2]. They need guidance like as an assistive technology to help their difficulty [3]. Then, mentally retarded students are the condition about limitation intelligence that needed something to help their difficulty.

Students need learning basic operations in mathematics such as addition, subtraction, multiplication, and division to achieve more complex problems [4]. Daily skills and math skills are needed by students with special needs to facilitate their lives and allow them to survive independently [5]. Then the advantage of mentally retarded children learns mathematics to ensure they can interact with their communities and reduce the risk of low numerical skills [6]. Furthermore, the calculation operation number in mathematics is very important for students.

The importance of math skills for students with special needs, so special teaching is needed for them [5]. A teaching mathematics can apply precise methods to help their study [7] or using Count-By method has proven can improve the multiplication fact fluently [8], for example, the use of fingers to perform addition or subtraction calculations [9]. In arithmetic operations can be mastered by knowing how to addition, subtraction, multiplication, and division and the relationship between addition and subtraction, addition and multiplication, and multiplication by division [10]. The students' initial knowledge must be known in order to change the misconceptions in mathematics and learning must be rearranged according



to students' learning abilities [11]. Therefore, to teach material about number operations must be careful so as not to cause misconceptions in the material presented.

In elementary school, many students make the same mistakes when doing addition and subtraction operations [12]. One other is mathematical calculation about the ability to divide due to not understanding the concepts and difficulties of applying in daily life [7]. The student feels bored, lack confidence, and not interested in the multiplication calculation caused by a student not mastered in multiplication facts [13]. The statements before inform that the addition, subtraction, multiplication, and division operations are material that are still considered difficult for students.

The results of the study conducted on September 24, 2018, found that the mentally retarded students of class VII still had not mastered operations number fluently. Students often forget how to operate or calculate in accordance with the concepts taught by the teacher. Less interest in mathematics lessons, students also influences the learning process. Students are more likely to other subjects than mathematics. In line with students' confidence in mathematics that is seen in the test results, students who have confidence can get higher grades than students with low self-confidence [14].

2. Method

The methods used in this research is descriptive, which describes the process of students in answering number operations such as addition, subtraction, multiplication, and division and knows the students' ability in operation numbers. The subject studied is a student with mental retardation seventh grade in SLB Bhakti Kencana 1 Berbah, which consisted of 3 students are female and a male student. Each subject has the age and characteristics are different. The subject A is a female student that have normal hearing but can't speak fluently (a spoken letter is not clear). In addition, it has a little bit of physical disability on the part of the left hand, which is a little stiff for driven. In contrast to the previous, student B (16-year-old) is a woman has normal physical and can communicate well. Student C has a normal physical but it is hard to communicate with new people (speaking with the voice of a very slow). Student D (male) with a normal physical can hear and speak fairly fluently (but not clear articulation).

Early stage to collect the data through an interview with the teacher. Information that takes from a teacher about the students' difficulties in operation number, it's mean how to calculate and how to apply the mathematics concept. From the information above, the researcher makes the questions (test) and give to students. Then, describes the students result included the correct or incorrect answers. Data retrieval from students is done using video recorders, voice recorders, documentation, and test questions that are done by students. Videos are used to view student activities while working on test questions. Voice recorder is to record the interview process with the teacher with audio results. Photos are used to document student results and activities during data collection. While the test questions are used to determine the ability of students to calculate and find the results of natural numbers operations.

3. Result and discussion

Research conducted on mentally retarded students in SLB Bhakti Kencana 1 Berbah uses a test consisting of 2 question packages. The thing that differentiates the two is at the level of the question (the number used in the problem). The first level questions are given to students who have received addition, subtraction and multiplication materials, namely students A, B, and D. While the second level question package is given to student who has not received multiplication and division material, namely student C. The results of the work on the two packages of the first question, it appears that students can sort numbers from 1-25 well. The researcher also gives a question of sorting numbers with each number having different tens of values. There is one student can do all the questions correctly, 3 other students do not work or are not right in sorting numbers. Table 1 presents the results of the work of all students.

Table 1. The result of students' task

Students Name	Arrange the Numbers	
	Finish	Description
Student A	✘	<ul style="list-style-type: none"> ● Not answer all questions ● Student finish all questions
Student B	✓	<ul style="list-style-type: none"> ● Student arrange the numbers clearly ● Student arrange the numbers from the biggest to the lowest ● Student finish all questions
Student C	✓	<ul style="list-style-type: none"> ● Student arrange the numbers from the biggest to the lowest clearly ● At number 2, student not clearly to arrange the numbers ● Student finish all questions ● At number 1, a student arrange the numbers from the lowest to the biggest clearly
Student D	✓	<ul style="list-style-type: none"> ● At number 2, Student not clearly to arrange the numbers ● At number 3, student arrange the numbers from the biggest to the lowest clearly

When working on the questions, student C works very slowly. He hasn't been able to read even memorize the letters of the alphabet. So the researcher helps to read out the commands to the problem and explain what student has to do. This is done repeatedly so student remembers the commands in each question. The next question about addition is from units to hundreds. The first level of added up to hundreds and second level questions only reaches numbers less than fifty. All students work on all the additional questions with different results, as shown in Table 2.

Table 2. The result of student task about addition

Students Name	Finish	Description
Student A	✘	<ul style="list-style-type: none"> ● Student not answer at number 1 ● At number 2 and 3 a student can answer correctly ● At number 4 and 5 students' answer is false. The addition of 46 with 67 is 101 and the addition of 193 with 125 is 210.
Student B	✓	<ul style="list-style-type: none"> ● Student answer all questions correctly
Student C	✓	<ul style="list-style-type: none"> ● Student answer all questions ● Only number 2 that the answer is correct
Student D	✘	<ul style="list-style-type: none"> ● At number 1, student not answer ● Student answer questions number 2-5 correctly

Student A calculates the addition in questions 4 and 5 by summarizing downwards. The error starts when summing the unit value. He forgot to write down the unit numbers of the results in the back of the order and forgot to add dozens that were saved from the previous sum. Student B does not experience problems in working on questions about addition and the answers obtained are all correct. While student C there is only 1 correct answer, the sum is less than ten, which is $6 + 3$. Student answer addition questions by writing one of the biggest numbers on the problem, as shown in Figure 1. From Figure 1 report that the students' answer makes a pattern. According to the teacher says, student C just learns simple addition use small numbers. Errors in some students are caused by several factors, namely lack of accuracy, errors in the application of rules to find solutions, and improper calculation [15].

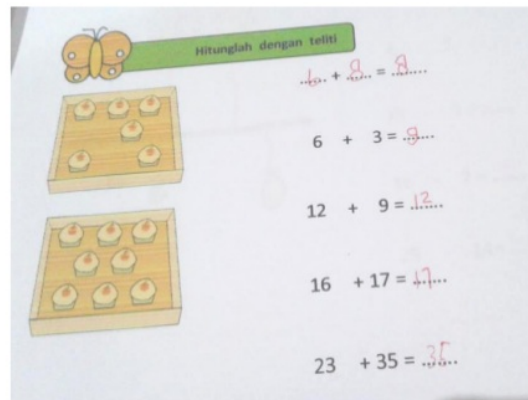


Figure 1. The answer of student C in addition operation

In the matter of multiplication operations there are only 2 students who answer the questions given by the researcher, namely students B and D. Student's answer B there are only 2 correct answers, the multiplication 2 with 3 is 6 (number 2) and multiplication 6 with 4 is 24. When the student calculates the operation, it appears that student already knows the concept of multiplication correctly. Like the multiplication 6×4 , the student adds to number 4 until 6 times. The multiplication is very important to the student. The opinion before supported with this statement that, the weaknesses in multiplication will have an impact on achievement low mathematics [13]. No student's D answer is right, it is possible that a student has not understood multiplication operations. Student D calculates multiplication by making circles, then crossing the circle as many as the numbers in the multiplication problem given. Like a multiplication of 2×3 , students make six circles. Next, the student cross out three circles, while the 3 circles that are not crossed out are the results of the calculation of student D as seen in Figure 2. The same thing is done by student D to calculate other multiplication questions.

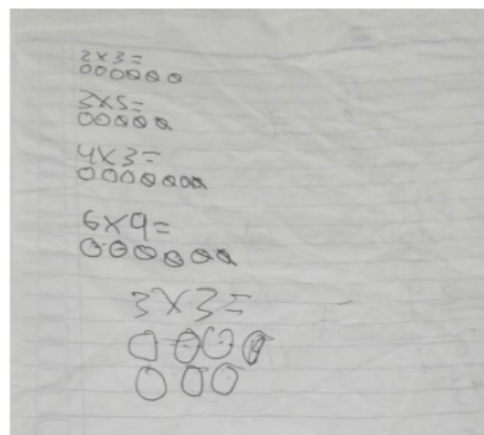


Figure 2. The student D calculations in multiplication

Not all students work on test questions, because there are students who have not received material about the subtraction operation, namely students A and C. All description of student answer sheets

about subtraction can be seen in Table 3. As well as the division operation, only student C answers all the questions correctly. While other students did not work, it is because they did not get the material.

Table 3. The students' answer of subtraction operation

Students Name	Finish	Description
Student A	✘	● Student not answer all questions
Student B	✓	● Student answer all questions correctly ● At number 4 the answer is false ($46-17=31$)
Student C	✘	● Student not answer all questions
Student D	✓	● Student answer all questions ● At number 1, 4, and 5 the students' answer are false

The results of interviews conducted with the teacher of the class said that the teacher had difficulty teaching the concept of operations to students. Because mathematical concepts that are abstract and difficult to understand by students should be taught by relating concrete problems of everyday life [16]. In addition, students often forget how to operate numbers, are less thorough, and students feel uninterested in learning mathematics. The teacher usually teaches using the money, assuming money is always used in everyday life and students are better able to understand using money in simple number operations. Sometimes the teacher feels confused about how to deliver the material because the Core Competence and Basic Competence learned are the same (Government Regulation No. 10 the Year 2017), but the ability of each student is different. Usually, the teacher equates the questions for students A, B, and D and student C is given a simple material that is just addition until the students haven't other difficulties. Agree with this statement that a student who experiences difficulties when learning that is incomplete and inaccurate in learning mathematics will influence the next learning [16].

Learning in mentally retarded students can be done using objects or interesting things. As in research, it conducted by using games in teaching mathematics to mentally retardation student [2]. You can also use an abacus as done [4] which states that teaching multiplication to students using an abacus is easier than using conventional methods. Teaching mathematics to mentally retarded children is more difficult than teaching normal students. This is supported by the statements of other researchers, that the increase in the value of mentally disabled students little by little because the mentally retarded students have difficulties in understanding mathematical concepts [17].

The other studies have severe inventions about the solution in mathematics learning in mentally retarded students, firstly a study conducted on mentally retarded student states that student has difficulty solving problems using multimedia, but after intervention student becomes more interested and wants to solve more problems [18]. Secondly, research that has been done on the use of envelopes to complete fraction operations states that students can solve problems with higher numbers and can reduce the errors [11]. Thirdly, using abacus as a tool, it can hone students' basic skills such as addition and multiplication [4]. Other studies explain that students can learn mathematics if given more guidance that can create an understanding of the process and how to think in order to achieve the right process [19-23]. Therefore, to teach the mentally retarded students can use the media or other means so that students are able to solve their problems correctly.

4. Conclusion

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In this study, it can be seen that students still difficulties in calculating the operation of natural numbers. These difficulty caused students do not understand the concept of number operations (addition, subtraction, multiplication, and division) and forget how to calculate according to the concept. A teacher also finds the difficulty in understanding to students about number operations and usually only taught by using money or assuming numbers to object that students can imagine.

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