



Analysis of Mathematics Learning Difficulties in Addition and Subtraction Material in Class II of SD Negeri 1 Ngumpul

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This research aims to examine the problems faced by students when learning mathematics in class II elementary school, especially in addition and subtraction material. This research is a type of qualitative research conducted in September 2023 at SD Negeri 1 Ngumpul. The method used is descriptive, with the research subject focusing on class II students. Research instruments include the use of tests, interviews, and document collection. The analytical method used is Miles and Huberman's interactive analysis, which includes the stages of data collection, data reduction, data presentation, and drawing conclusions. Research findings indicate that 1) a number of students have difficulty understanding addition and subtraction material; 2) this difficulty is caused by limited reading ability, so students find it difficult to understand the meaning of the questions; 3) This problem is also experienced by class II students because their understanding of the concept of sequential addition and subtraction is still not optimal; 4) students' learning difficulties are caused by a lack of attention to the use of addition and subtraction symbols in saving and borrowing techniques. Based on research suggestions, it is to support assistance in the process of learning addition and subtraction by educators or parents, as well as presenting questions in stages, according to commonly used learning methods.

Keywords: Addition and Subtraction, Learning difficulties, Mathematics

INTRODUCTION

The purpose of education in Indonesia, as explained in the fourth article of the 1945 Constitution, is to improve knowledge and the quality of people's lives. These educational objectives are well designed through several stages which include educational objectives that apply nationally, objectives held by educational institutions, curriculum objectives, and learning objectives. (Hamalik, 2014). A problem that still exists in the learning process, especially in official educational environments, is variation in students' understanding of the subject matter. This variation is caused by varying levels of student concentration. The main factor that influences this variation in understanding is differences in students' ability to grasp lesson material.

When students face difficulties in the learning process, they experience obstacles in completing assignments given by educators. These obstacles originate from disorders that arise within students, such as neurological disorders, psychological processes, or other factors. As a result, students have difficulty following lessons in class, and this affects their achievement, which becomes low (Yeni, 2015). Students who experience difficulties in the learning process require special attention so that their academic performance can be improved.

One of the challenges in the learning process of students at various levels of education and in various subjects is mathematics. According to (Suryadi, 2019), The concept of place value material must be mastered by students before learning addition and subtraction operations. Therefore, because of the importance of place value material, teachers must strongly instill the concept of place value in students starting from grade I. However, on the other hand, there are learning obstacles faced by students while studying place value material. Learning difficulties in mathematics are also usually characterized by frequent errors in calculations, difficulty in understanding geometric principles, and difficulty in solving mathematical problems in the form of narratives. (Muhamad Arif Syafiudin, 2018).

The existence of variations in the causes of learning difficulties for each student during the learning process is significant. In mathematics subjects, educators must be able to instill concepts through easy and interesting learning activities for students using varied learning models (Andria Putri Lestari, 2020). Using an interesting and varied learning model will make it easier for students to understand mathematical concepts so that learning will be enjoyable and not difficult for students and can improve students' mathematics learning outcomes. One aspect that might trigger learning difficulties in class II of SD Negeri 1 Ngumpul is a less than optimal level of intelligence. However, it should be noted that learning difficulties can also be influenced by factors other than intelligence level. Therefore, having a high level of intelligence does not always guarantee good learning achievement.

Based on observations that have been carried out, it appears that students face obstacles in mathematics subjects, so they tend to lose motivation when faced with mathematical situations. Only a few of them dare to actively participate in class discussions. Through face-to-face interactions or

interviews conducted with teachers at the class level, it was revealed that students at the second level of education faced difficulties when undergoing the learning process in mathematics. The difficulties they experience are related to difficulty understanding the nature of the questions presented and feeling confused in determining the type of calculation operations they should apply. In addition, students often make mistakes when performing sequential addition and subtraction operations. This finding is reinforced by the daily test results which show that their ability in addition and subtraction material is still below the minimum graduation standard (KKM).

Given how important mathematics is and the challenges many students face in this subject, it is not surprising that much research has been conducted to understand students' abilities to think and learn mathematics. According to previous research, third grade students face difficulties in mathematics because they do not fully understand the purpose of the questions and also have difficulty carrying out calculations using the sequential method (Ilham Raharjo, 2021). Meanwhile, a researcher noted the various challenges faced by students during the learning process. One of these challenges is difficulty in understanding and recognizing symbols. Moreover, there are obstacles in reading ability and other factors that influence students' learning difficulties (Devi, 2019). (Murzani, 2018) stated that students experience challenges when trying to understand mathematical concepts, perform calculations, recognize symbols, and understand the mathematical language used in problems.

This is based on the results of interviews conducted with class II teachers at SD Negeri 1 Ngumpul. Based on the information given by the teacher in the interview, the researcher found problems related to addition and subtraction material for learning mathematics, namely students' learning difficulties when doing assignments with addition and subtraction material. The interview results were also supported by unsatisfactory exam results. Therefore, the aim of this research is to analyze students' difficulties in completing addition and subtraction material in class II of SD Negeri 1 Ngumpul.

METHODS

This research uses a descriptive approach by applying qualitative research methods. Qualitative research is an approach that involves data acquisition in the form of descriptions through interview interactions or written notes from the subject that is the focus of observation (Luthfiah, 2017). According to (Sukmadinata, 2012), The descriptive approach is a research method that aims to explain in detail events or phenomena that are currently taking place or have occurred in the past. This research applies a descriptive approach with qualitative research methods to analyze mathematics learning problems in addition and subtraction material for class II elementary school students.

This research took place at SD Negeri 1 Ngumpul, which is located in Bagor District, Nganjuk Regency. There

are nine second grade students who are the focus of this research. They were analyzed and given questions regarding addition and subtraction operations. Research begins in September 2023, at the same time as the first semester of the 2023/2024 academic year.

Three data collection methods were used in this research, namely tests, interviews and documentation. The test consisting of ten essay questions was given to class II students at SD Negeri 1 Ngumpul. The aim of this test is to support students' understanding of the concept of solving addition and subtraction problems and the results show that 6 students got scores above the KKM and 3 students got scores below the KKM. Apart from that, the class II teacher at SD Negeri 1 Ngumpul was interviewed as well as the students after being given the essay test. This documentation was then also used to collect data as archival data on mathematics learning outcomes at SD Negeri 1 Ngumpul II. The types of errors analyzed were difficulty calculating the order and difficulty understanding the meaning of the question.

Sparadley revealed that qualitative data analysis is a test that can formulate relationships between the whole and relationships between research in an orderly and logical manner so that they can be related to each other to work together. (Rakhmaniah, 2017). In this research, the researcher put forward three stages which will later be analyzed based on qualitative descriptive data. The following is an explanation according to Miles and Huberman, namely: data reduction, data presentation, and drawing conclusions. At the data reduction stage, we produce a summary and select significant elements. Apart from that, we also focus on important aspects and try to identify relevant patterns and themes. Through data reduction, we can create more detailed views and make information mining easier for researchers. In this research, the researcher first improved student achievement. After that, these students were identified as research subjects. After the data has been reduced, the next step in the analysis is to present the data. According to (Rijali, 2018), data presentation refers to a well-organized arrangement of information, which ultimately allows us to reach conclusions or take appropriate steps. In this phase, the researcher attempts to collect relevant information in order to obtain data that has significance in resolving the research problem. In the context of qualitative research, conclusions may or may not be in accordance with the previously posed research questions. The reason lies in the characteristics of qualitative research which focuses on in-depth understanding, where questions and problem formulation can change along with the development of research in the field. (Sugiyono, 2018). Based on the findings of this research, it can be concluded that second grade elementary school students face difficulties in understanding the concepts of addition and subtraction.

FINDINGS AND DISCUSSION

Research result

Based on the findings of research conducted on class II

students at SD Negeri 1 Ngumpul, it can be seen that there are students' learning difficulties in solving addition and subtraction material problems. Students experience difficulties when working on questions, which is because students are in a hurry to work on the questions given, apart from that, students are not careful in working on the questions. As for working on mathematics lessons, especially in addition and subtraction material.

The test given to students consists of ten questions that require them to add and subtract. In the first and second questions, there are situations involving short-form basic mathematics lessons. All students in class II were able to answer correctly questions regarding short addition and subtraction. Therefore, the interview results show that students did not face any difficulties in answering questions 1 and 2. In fact, one student expressed a good understanding of problems related to short addition and subtraction.

Some students face difficulties in solving problems number 3 and 4 which involve addition and subtraction operations using long sequence techniques. Among them, there was a student known as KH who stood out by achieving a score above the Minimum Completeness Criteria (KKM) and answering the questions with accuracy. KH has the ability to write numbers based on hundreds, tens and correct units, and can calculate the final result with a high level of competence. On the other hand, students like AD and several other students failed to answer questions number 3 and 4. The following is a picture of student AD's incorrect test results on numbers 3 and 4.

[Figure 1. About Here]

After conducting additional interviews through oral interaction, the researcher found that AD and the students faced difficulties in responding to questions because they were unable to carry out addition and subtraction operations using the long sequence technique. These questions are also considered a challenge because they require them to write numbers based on hundreds, tens, and ones.

Then, the fifth question performs the addition operation by storing it. In this question, a student identified with the initials AN has succeeded in achieving a score that exceeds the minimum limit for graduation (KKM). These students are able to solve questions correctly and formulate answers that are relevant to the question material. In this fifth question, students are asked to apply the concept of storage when carrying out addition operations.

AN is able to provide accurate and precise answers on tests by recording the numbers which will be stored. On the other hand, AI cannot give correct answers in tests, and in answering addition questions using a number storage strategy, AI often gives wrong answers. The AI does not remember the number 1 in the answer and immediately includes the final answer, causing the answer given by the AI to be incorrect. The following is a picture of the AI student's incorrect test results in number 5.

[Figure 2. About Here]

The sixth problem is a type of addition problem that applies the storage method. In the sixth question, MA gave the correct answer and used the number storage method in answering the addition question. MA answered correctly and followed the correct procedure in writing the answer. MA put the numbers that needed to be saved in the appropriate places and managed to calculate the final result correctly. On the other hand, the AI gave the wrong answer to question number 6. This happened because the AI did not carry out the number calculation process correctly, namely by including numbers that could be stored as answers, which ultimately produced an incorrect answer. Apart from that, there are students who have difficulty answering addition questions because they give answers without doing the calculations first.

[Figure 3. About Here]

In number 7, MA succeeded in solving the subtraction problem correctly and used the number borrowing technique correctly. Thanks to this ability, MA succeeded in getting the correct results. However, AD experienced an error in answering the same question. AD managed to write the borrowed number correctly, but did not make the necessary subtraction. Because of this, AD failed to answer the question correctly. This situation is similar to AI's answer in answering question number 7, where AI also made a similar mistake as AD did in that case.

[Figure 4. About here]

In question number 8, SA has the ability to answer correctly and solve subtraction problems using borrowing techniques. Likewise, AN and other friends also have the ability to solve the same problems precisely and accurately. Problems 7 and 8 involve subtraction using borrowing techniques. The results of the interviews revealed that AD students faced difficulties because they tended to record their answers directly without subtracting the numbers that needed to be borrowed.

In the ninth question, AN is a student who succeeded in answering the question correctly. He succeeded in showing his ability to solve these questions and provide correct and relevant answers. AN can present the necessary information, understand what is being asked, and perform calculations appropriately. Many students do not note down the steps needed to answer question number 9. They only count the number of apples based on the picture without writing down what they know and what is asked in the question that must be answered. The results of the interviews showed that these students only counted the number of apples without paying attention to what was known and asked the questions asked. The following is a picture of the wrong NS student test result in number 9.

[Figure 5. About here]

There are differences between the answers given by individuals with the initials "NS" and the answers from other students. NS, together with one of the other students, gave

different answers in determining the number of apples. NS stated that the number of apples depended on the picture depicting the number of apples, without including any further explanation about his knowledge or the questions asked. NS immediately gave a concrete answer. Meanwhile, VA did not provide any response and just left the answer sheet blank.

[Figure 6. About Here]

Then, students are asked to solve problems related to everyday life in the story problems contained in question 10. In this question, AN succeeded in answering question 10 accurately and precisely. AN is able to provide answers that match the information contained in the story questions, answer the questions asked, and achieve correct results. AN succeeded in completing this story well. On the other hand, three other students did not succeed in solving question number 10.

According to the research results, it was revealed that the average score of students was 68.8. It turned out that this score was below the minimum threshold score that had been set for passing mathematics, namely 70. Of the nine test takers, only six participants were able to achieve a score above the minimum threshold score. The highest score achieved in this trial was 90, while the lowest score obtained was 60.

Apart from relying on test results, the researchers also conducted interview sessions with four students from class II of SD Negeri 1 Ngumpul. These students had previously taken tests given by researchers and achieved results above the Minimum Passing Score (KKM), below the average, and below the KKM score. These four students are AN, NS, AD, and SA. The results of the interviews revealed that AN, NS, AD, and SA had a good understanding of the concepts of addition and subtraction. What was interesting was that they all showed great interest in mathematics. Then, they show positive behavior when learning mathematics and follow the lessons well. The results of the interview showed that during the lesson, AN paid sufficient attention to the lesson time involving NS and SA. Meanwhile, AD still looks unfocused, confused, and spends more time with his other friends.

Discussion

After carrying out an in-depth analysis of the data obtained in research conducted at SD Negeri 1 Ngumpul school, the test consisted of ten mathematics questions with addition and subtraction material. The tests are divided into four types, including simple addition and subtraction tests without applying borrowing and storing techniques, long-form addition and subtraction tests, simple addition and subtraction tests using borrowing and storing techniques, and tests using story questions. One of the first types of questions in this exam is short-form questions, where the technique used is the usual technique, that is, without borrowing and saving. This type of question consists of two parts, namely question number 1 and question number 2. Next, there are two questions about arithmetic operations

that use a longer structured technique, namely questions number 3 and 4. Then, in questions number 5 and 6, there are two questions that require storage techniques. Next, there are two questions that must be solved in a way that is appropriate to everyday situations in questions number 9 and 10.

In class II of SD Negeri 1 Ngumpul, students succeeded in giving accurate and precise answers to questions number 1 and 2. They were able to identify mathematical symbols, such as addition (+), subtraction (-), and equality symbols (=). Thus, no student gave a wrong answer to questions number 1 and 2. According to (Unais Mabruroh, 2020), students have difficulty understanding symbols, which causes them to face challenges in learning mathematics. However, students were able to write and calculate answers correctly, indicating that they did not face any difficulties in solving questions 1 and 2.

Moreover, many students often experience difficulties when trying to solve questions 3 and 4. These questions involve mathematical calculations using a sequential approach. Wrong results are often produced by many students, and some do not even provide answers to the questions at all. According to (Devi, 2019), difficulties in the learning stage arise because students feel confused when digesting the idea of sequential addition involving numbers in hundreds, tens and ones. This phenomenon can be observed through evaluation results which show that students often face difficulties in determining the numbers that should be recorded in the answer column. According to (Selvianiresa, 2017), students have difficulty understanding mathematics, especially in determining the place and value of tens and hundreds. The results of interviews with students who scored below the passing standard (KKM) revealed interesting findings. Students have difficulty understanding math questions and cannot explain the values of the hundreds, tens and ones digits contained in the question.

When answering questions number 5, 6, 7, and 8, there were visible learning difficulties in the students. These questions involve the use of mathematical operation techniques such as addition and subtraction in the form of short questions. Difficulties faced by students include errors in recording accurate final results. Students often face difficulties in calculations because they are not careful enough when answering the questions given (Unaenah, 2018). Many students immediately record the numbers that need to be saved. Likewise, there is also a method of deduction called borrowing technique. Students record their answers without deducting the figure for which they took out the loan. According to (Kandou, 2017), students face obstacles in the learning process because they tend to be less careful in calculating answers and often make mistakes in calculations. Even though they have met the required mathematical literacy standards, the main goal of the mathematics curriculum is to improve their mathematical literacy skills.

Literacy skills in mathematics learning are very important, so students are expected to have these skills. (Nur Indah, 2016), mathematical literacy refers to the mastery of

knowledge that allows individuals to apply mathematical concepts in the context of everyday life. With these skills, a person can develop the ability to assess information, solve problems related to mathematics in everyday life, apply logical thinking in situations involving numbers, graphs and shapes, and communicate using mathematical language.

The interview results confirmed what had been observed in the test of a student scoring below the passing standard. AD admitted that he had an understanding of the techniques of adding and subtracting operations using borrowing and writing methods, but the results were not correct because he tended to focus less on the questions and written answers. The learning difficulties faced by these students are related to the frequency of errors in carrying out mathematical tasks, including illegible writing and inaccurate calculations (Murzani, 2018).

Then, questions number 9 and 10 are story questions that need to be answered to overcome everyday situations. Several students who took the test have succeeded in answering questions number 9 and 10 correctly and completely. Students experience difficulties when trying to complete this story question due to several factors, such as difficulty in reading or understanding the meaning of the question. If a student does not have good enough reading skills, then he will face difficulties in understanding the purpose or message contained in the questions in the form of narratives. Research conducted by (Dian Riky Utari, 2019) stated that students often face difficulties when carrying out story problems because they do not fully understand the essence of the story and feel confused in determining the type of arithmetic operations that need to be used. Mathematical literacy basically plays an important role comparable to reading and writing skills. Reading in the domain of mathematics refers to the process of understanding mathematical texts or reading materials written in everyday language related to mathematics, including symbols, algebraic equations, graphs and diagrams. This emphasizes the ability to interpret and give meaning to the mathematical information presented. Meanwhile, in the context of mathematics, writing is a skill in conveying mathematical ideas and understanding through writing as a result of the process of reading, interpreting, and giving meaning to real world situations with a mathematical perspective. According to (Praise Astuti, 2019), previous research has indicated that students' reading abilities have implications for their ability to appreciate reading texts. In simple terms, if someone can communicate mathematical concepts, both in written and oral form, including the ability to read, understand and write about mathematics, this reflects the activation of their mathematical literacy.

When solving story problems, students need to record the information they know from the story, note down the questions asked, and give the correct answer when answering the questions. Often, students make the mistake of not recording the information they already know and the questions asked when facing story problems (Arif Fatahillah, 2017). A number of students face difficulties in responding to narrative questions because they are unable to efficiently organize the data they know, recognize the need for the

question, and formulate an appropriate response. This problem is often experienced by elementary level students. They not only face difficulties in understanding and interpreting narrative question texts, but also in transforming data from questions into a format that is simpler to understand, implementing mathematical thinking processes, and expressing their responses in writing. (Arif Fatahillah, 2017). Typically, students will follow the pattern of copying the sentences from the question and inserting them into the appropriate places on the answer sheet. Apart from that, students also often write answers without recording the information they already know and what is being asked in the question.

Class II students at SD Negeri 1 Ngumpul experienced difficulties in the learning process. These difficulties can be identified through the use of triangulation and source triangulation techniques. Many of these students show interest in math subjects, but they are not interested in taking additional hours in math classes. Class II students usually only study at home if there are additional assignments such as homework (PR), and they have no plans to continue studying if there are no additional assignments. An interview conducted with a parent of a grade II elementary school student showed that the student received important support from his family when studying at home. However, these students often choose to play rather than continue their learning activities at home.

In the learning process, each individual faces specific obstacles that can affect their learning abilities, and learning does not always happen by itself (Emi Zakiyah, 2019). Learning mathematics addition and subtraction is very popular with students because of the variety of teaching, such as lectures, questions and answers, and realistic learning models applied by class teachers. When students like VA and his friends face difficulties in understanding lessons or completing assignments, they actively communicate with their mathematics teachers and ask for additional explanations. After various efforts, most students in class II of SD Negeri 1 Ngumpul have succeeded in understanding how to identify symbols in mathematics. However, there are still some students who do not understand how to add and subtract using stacking techniques and in story problem material.

CONCLUSIONS

It can be concluded that mathematics learning for class II students at SD Negeri 1 Ngumpul, Bagor District, Nganjuk Regency, experiences difficulties in addition and subtraction. Based on research, there are several class II students who experience difficulty in learning addition and subtraction material. Contributing factors to these difficulties include low reading ability, which causes difficulty in understanding mathematical problems. Apart from that, not understanding the concept of addition and subtraction also creates difficulties. Another difficulty is the lack of concentration in using addition and subtraction symbols, especially in the stacking technique. Several

suggestions can be made based on the research results. One important suggestion is to provide guidance during the process of learning addition and subtraction by teachers or parents. In addition, it is recommended to give practice questions to students in stages according to their level of difficulty. The aim of this stage is to train their skills in performing addition and subtraction tasks regularly.

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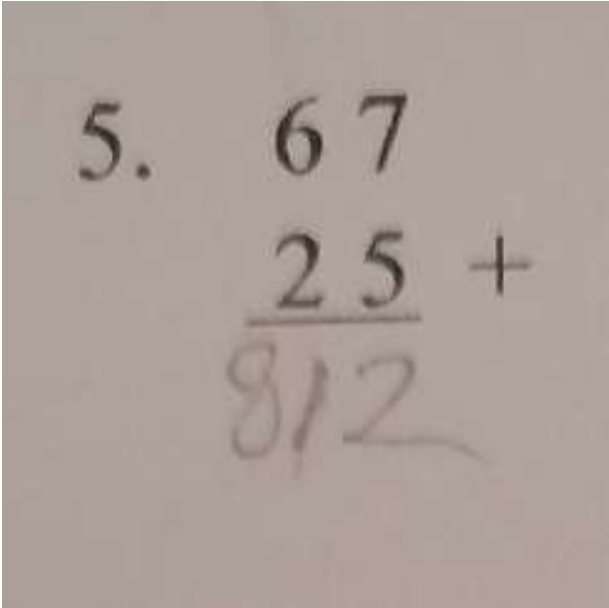
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3. $146 = 1... + 4... + 6...$
 $217 = 2... + 1... + 7... +$
 $= 3... + 5... + 12...$

4. $578 = 5... - 7... - 8...$
 $353 = 3... - 5... - 3... -$
 $= 2... - 2... - 5...$

Figure 1 / AD students' mistakes in the long-form technique



A photograph of a student's handwritten work on a piece of paper. The work shows a math problem: "5. 67" followed by "25" with a horizontal line underneath it, and a plus sign to its right. Below this, the student has written "812". This represents an error in the addition of 67 and 25, where the student has incorrectly calculated the sum as 812.

Figure 2 / AI student errors in saving techniques

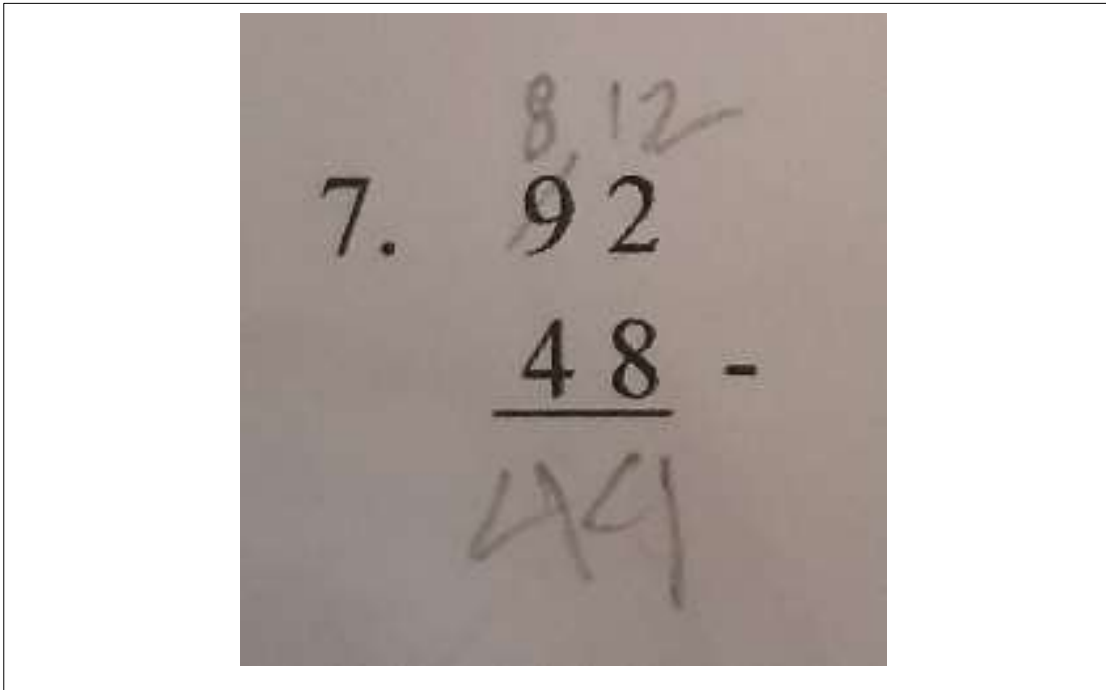


Figure 3 / MA Test Results for borrowing techniques

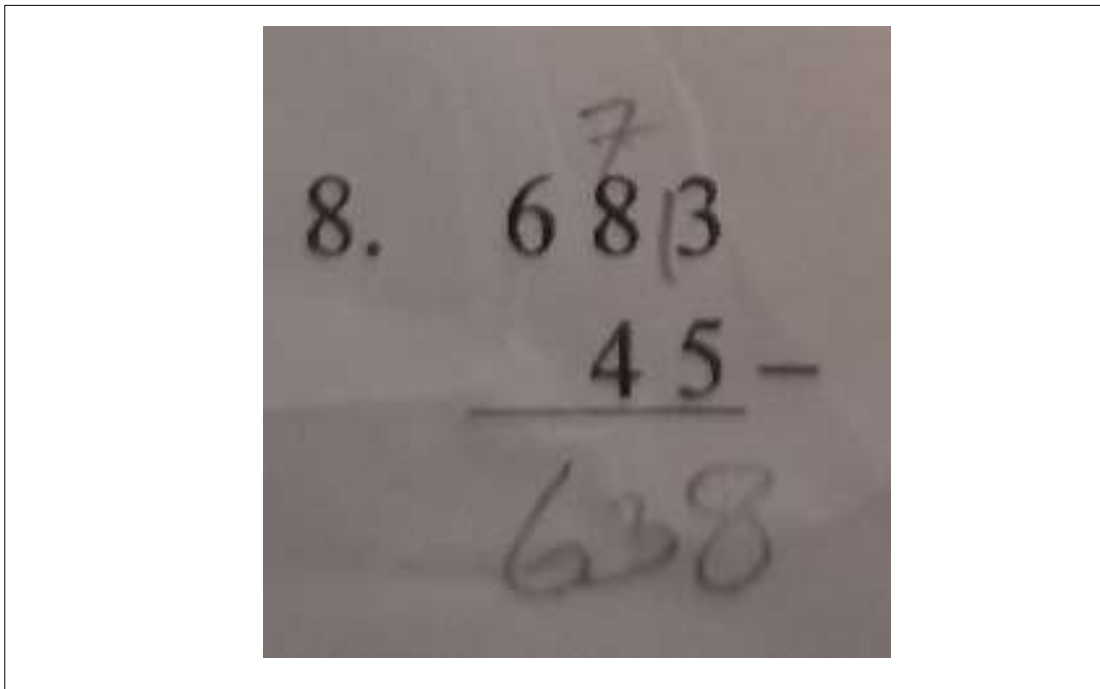
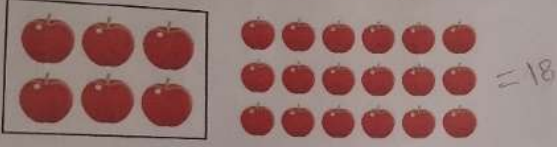


Figure 4 / SA Test Results for borrowing techniques


9. Laras dan Luna melihat bu Rara pulang dari pasar dan membawa buah seger. Laras dan Lua datang membantu bu Rara mengangkat buah tersebut. Laras membawa 6 buah apel dan Luna membawa 12 buah apel. Jumlah buah apel yang dibawa Laras dan Luna adalah.....



Diketahui : 18
:
:
:
Ditanya :
Jawab :

Figure 5 /NS students' mistakes in the technique of understanding the meaning of the question

10. Di rumah Dewi ada acara keluarga. Dewi berbagi donat kepada keluarganya. Dewi menyediakan 24 potong donat, 12 potong donat kepada keluarga ayahnya dan memberikan 6 potong donat kepada keluarga ibunya. Berapakah jumlah sisa potongan donat yang dibawa Dewi?



Diketahui : Jumlah total Donat = 24
 : Donat kepada keluarga ayah = 12
 : Donat kepada keluarga ibu = 6

Ditanya : Sisa donat

Jawab : $24 - 12 - 6 = 6$

Figure 6 / AN Test results in techniques for understanding the meaning of the questions