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## Exploring Thinking Process of Students with Mathematics Learning Disability in Solving Arithmetic Problems

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## Exploring Thinking Process of Students with Mathematics Learning Disability in Solving Arithmetic Problems

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### Abstract

The student's criterion for being diagnosed with MLD (Mathematics Learning Disabilities) can be classified as low arithmetic skills and poor working memory. The goal of this research is to understand students' process of thinking through the Polya stages when tackling arithmetic problems, as it has been expounded by Dr. Polya. For students who have mathematics learning difficulties, the information is gathered by administering math problems to both females and males that ask the correct questions and have to be answered in their heads. The data gathered from the study concluded that students exhibit degrees of mental disorder that are caused by 3 distinct stages in which they must be addressed: problem-solving underachievement, when they are overreaching, and cognitive imbalance when they are overcommitted. To arrive at equilibrium, the more significant expansions must be coupled with an extensive assimilation and assimilation process. As students with moderate to severe learning disability were completing multi-digit addition and multiplication, they underwent assimilation. Because of this, the cognitive fluidity present at this moment, the students have already found themselves in their present-looking-backward state of mind.

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### Introduction

Today, there is a strong demand for students with an MLD (Mathematic Learning Disability) education all over the world. Under the concept of Learning Disabilities (LD), children with mathematical disorders are explicitly included. Special education programs are almost solely offered in many school systems based on children's reading difficulties (LDA, 2021; Kemp, Aubrey & Vidakovic, 2021). Even after being diagnosed as LD, few children receive a thorough evaluation and treatment for their math problems (Garnett, 2021; Skoumios & Skoumpourdi, 2021; Susanto, Hobri & Nugrahaningsih (2021). Some researchers, such as Wong et al. (2014), use latent class growth analysis to identify MLD students, while Simon et al. (2012), Utomo (2021), Bicer (2021), and Lee & Lee (2020) use the computer-based Learning Disability Test to diagnose MLD secondary students. MLD has been diagnosed in approximately 6 to 10% of children in China (Cai, et al, 2013). MLD was triggered by a failure to connect symbolic number representations to appropriate non-symbolic representations rather than a problem with number processing (Bartelet et al). (2014). There are no clear

parameters for identifying MLD students, but the MLD can be described as a student's inability to learn mathematics as evidenced by their weak arithmetic capacity (LDA, 2021).

According to Murphy et al. (2007), students with MLD have a low level of cognitive skills that can be classified as arithmetic skills disorder. It also demonstrates the relationship between low arithmetic abilities and overall intelligence and age. According to Geary (2004), many children with MLD, regardless of their level of reading achievement or IQ, have a poor conceptual understanding of some aspects of counting.

We use a problem solving approach in this paper to analyze the thinking process of students with MLD when solving arithmetic problems. The act of defining a problem, determining the cause of the problem, identifying, prioritizing, and selecting alternatives for a solution, and implementing a solution is known as problem solving (Polat, 2020). It can be used to assess students' cognitive processes. According to Keat et al. (2017), cognitive development refers to the development of knowledge and acts of knowing, such as observing, remembering, problem-solving, reasoning, and understanding. Problem-solving is a process that a person goes through in order to solve a problem until the problem is no longer a problem for him. The topic of arithmetic is involved in this study because it needs to be broken down into sub-field processes before a general approach can be determined (Iglesias-Sarmiento, 2017).

Gender differences did not affect students' mathematics achievement, according to Salihu et al (2018); however, their places, as well as their social economic statuses, have a significant impact on students' mathematics ability. Students' reading comprehension and understanding proficiency are strong initial determinants of learning difficulty levels. Furthermore, the students' backgrounds, which are the skills they have gained over the years in previous education, can be seen as another determinant of their level of mathematical abilities (Skoumios & Skoumpourdi, 2021). Math skills issues can be linked to a student's reading comprehension and context (Lee & Lee, 2020). Geary (2004) found that 5% to 8% of students have difficulty understanding mathematical concepts due to some degree of cognitive memory impairment.

This article on cognitive memory was written in conjunction with an arithmetic analysis. To study three subtypes of mathematics learning and the general context that had been addressed, researchers linked cognitive memory research with students' disabilities in learning mathematics ability (Bicer, 2021). Assimilation, according to Pritchard & Wollard (2010), is a process of updating information by collecting and classifying new information. Also known as a substitute schema in place of individual schema: relates the overall concept of a series of linked knowledge applications of the consistency of both of external structures and changing internal applications (Yang, 2010). New and identifying the new or exciting information must be accomplished by altering an old set of ideas (Susanto, Hobri & Nugrahaningsih, 2021).

Piaget (1966) frequently uses the term "expanded equilibrium" to denote one of cognitive development in one of his hypothetical constructs. The "simplastical equilibrium" has been used to describe this balance between assimilation and accommodation. Balance must be a movement in order to achieve balance. This is more in line with Piaget's view, who proposed a much greater focus on the psychological balance. According to Piaget &

Inhelder (1969), the system of equilibration is explained by those concepts (motor, perceptual, and concrete) that enable it to occur (or when it does, they enable it). Like a cognitive and biological metaphor, the term equilibration serves the same purpose: equilibration. Through an uninterrupted balancing of input and output, you can maintain harmony and balance (Piaget & Inhelder, 1969). Piaget (1966) describes equilibration as an actively dynamic and in a one-way system where the different component properties change and there is a transformation in the opposite direction, the way to operationalize science and instruction in the spirit of (Bormanaki, et al, 2017).

This recent research shows the current state of secondary school education in Indonesia with regards to the development of MLD. Its interest in learning disabilities is “specific to the field of mathematics” (Mazzocco, 2009, p. 1). The topic of “hematics learning difficulties” includes: various reasons students experience such as biological differences, socio-economic inequalities, a lack of adequate preparation in content, inadequate support for early, and delivery of effective instruction (Chinn, 2015). Cultural differences and parents' beliefs about learning and whether or not their children show interest in learning influence MLD (LDA, 2021; Garnett, 2021). Sensituality viewed as educational and emotional factors are all applicable (Kunwar & Sharma, 2020). In many of these children are faced with learning difficulties, such as learning disabilities, gifted students' failures, ADD, and dyslexia (Hornigold, 2015) that should be helpful, simple, quick, and produce excellent results (Sharma, 2020). As a result, a math teacher must be cognizant of students' learning difficulties, especially those associated with disabilities, in order to promote desired learning.

### **Research Questions**

As the background suggests, this research determines the research procedures in line with the following research questions.

- 1) What are the performance of MLD students in describing their level of competence and memory basis in the learning process?
- 2) How do MLD students demonstrate their ability in learning process to show the thinking performance?

### **Review of Literature**

LD has been defined variously such as in ALD (2021), Garnett (2021) and several studies on MLD. LD may also fall under the broad umbrella term of "learning disabilities," including: dyslexia, dysgraphia, and specific learning difficulties (LDA, 2021; Garnett, 2021). Specifically, LD is addressed to indicate “specific learning disability,” A “curing” learning disability is a lifelong challenge (Bicer, 2021). People with LD, on the other hand, can achieve success in school, at work, in relationships, and in the community with the right support and intervention. Difficulty learning can be caused by visual, auditory, motor, emotional, or cultural issues, and socioeconomic issues. While the majority of people tend to have average intelligence, people with LD generally score above average (Skoumios & Skoumpourdi, 2021). The cause of LD is often “untapped potential”, so they are called “hidden disabilities” (LDA, 2021; Garnett, 2021; Hamukwaya & Haser 2021). LD are “uncapt to unlock” potential. Although students who have difficulty learning basic math facts will frequently put in a lot of

effort to memorize them, they rarely succeed in "memorization." instead of knowing that  $5 + 7 = 12$  or that  $4 \times 6 = 24$ , these children have grown more indecisive and tedious with the progression of time (LDA, 2021; Garnett, 2021).

Some LDs prevent one from doing well in math and memorizing information in four symptoms (LDA, 2021; Garnett, 2021). These four symptoms are dyscalculia, dyslexia, dyscalculpraxia and oral/written language deficits (Kunwar, Shrestha & Sharma (2021). Dyscalculia denotes a specific LD that affects a person's ability to understand numbers and learn math facts. Dyslexia is an inability to understand non-verbal cues, such as facial expressions and sarcasm (Bicer, 2021; Garnett, 2021). Dyslexia is defined as "difficulty with numbers or math." Dysgraphia is a type of difficulty which causes difficulty with handwriting and fine motor control. Dyscalculpraxia is a learning disability that interferes with numerical concepts, accounting calculations, and reasoning (LDA, 2021). In addition, non-verbal dyslexia lacks the ability to correctly read nonverbal cues or has poor coordination. The difficulties a person with a specific learning disability may have with reading and writing. Oral or written LD and Specific Reading Comprehension Deficit relates to the deficits on reading comprehension. A specific reading disability is a learning disability that affects the ability to comprehend what is read or heard. It's also possible that your ability to communicate verbally could be hindered (LDA, 2021; Garnett, 2021; Susanto, Hobri & Nugrahaningsih, 2021).

Some students with learning disabilities have physical conditions that interfere with one or more cognitive processes related to learning (Kunwar, Shrestha & Sharma (2021). Due to processing problems, such as dyslexia, good basic reading, writing, and math skills are often disrupted. They may also interfere with more advanced skills such as fine motor skills, organization, time management, short term memory, and the ability to focus. LD can impact one's life beyond the classroom and work. One of the more common types of learning problems is difficulty with reading, writing, or arithmetic. These difficulties are often diagnosed during the primary school years (Garnett, 2021; Bicer, 2021). In some cases, students, self-directedness does not appear until later in higher education or working full time. Others who are undiagnosed, who have learning difficulties may never know why they are having problems in school or with relationships with family and friends (LDA, 2021; Garnett, 2021; Kemp, Aubrey & Vidakovic, 2021).

Parents and teachers might believe that arithmetic problems are commonplace. However, around 6% of school-age children have significant math deficits, as well as significant learning disabilities (Kemp, Aubrey & Vidakovic, 2021). This is not to say that all LD occur alongside specific reading difficulties. This falsifies the social myth that it is acceptable to be dumb at math. A great deal of the life problems faced by adults who were deprived of math skills in school stem from that fact. Mathematics is just as important in today's world as it has always been (Garnett, 2021; LDA, 2021; Bicer, 2021). On the average, MLD students will experience difficulty in (1) reversing and "basic" facts, (2) facts will be weak, (3) low calculation abilities, (4) difficulty in mental arithmetic, (5) weakness in estimated numbers & numbers, (6) difficult basic facts are the norm; (7) calculation and addition; and (8) MLD students have low numerals and estimation and basic facts (LDA, 2021; Garnett, 2021). LD is viewed as situational, particularly external to the child, and as a result of specific causes such as physical, educational, emotional, and environmental factors (Kunwar & Sharma, 2020). Students with LD,

among other things, need assistance with advanced mathematical topics in addition and subtraction (Hornigold, 2015), yielding the best possible result (Sharma, 2020). Yet, the teacher must also be aware of his or her students' weaknesses, like LD to bring about the special help that is required to resolve the issue (Skoumios & Skoumpourdi (2021).

Speer, King & Howell (2015) conclude that prospective high school mathematics teachers (or those with equivalent credentials) don't understand the curriculum as well as they should do to access specialized content to understand, evaluate, or to draw on in mathematics. Scherer, et al. (2016) consider students with MLD experience are addressed to have perceptual (counting, memorizing) and theoretical (place value, classifying) challenge. Seen from teachers' view, these factors may arise perception that concepts and procedures of MLD are complicated but they are not the only ones responsible for slow progression (Jordan & Levine, 2009; Resusser, 2000). Students may or may not have MLD, depending on a combination of factors such as genetics, neurological impairments, and the actual environment in which they are educated and students with identifiable by biological characteristics (Lee & Lee, 2020).

Instead, students with lower performance expected understanding of procedural and conceptual knowledge that benefit from targeted interventions. Just because all students aren't doing well in mathematics it doesn't mean that all of them have low MLD. Students with MLD can be placed in regular and special education classrooms, alongside their regular education teachers, or on an equal basis with their inclusive education teachers. It could be determined whether they had disabilities or not with competent specialists in this area. Regardless of whether the MLD comes from the students, these classrooms' students are observed and taught, they demonstrate growth in their understanding of mathematics (Kunwar, Shrestha & Sharma, 2021; LDA, 2021; Kemp, Aubrey & Vidakovic, 2021; Garnett, 2021).

## **Method**

### **Research Design**

This study was qualitative in nature and used a descriptive design (Patton, 1990) to examine how MLD students performed on math tests and solved problems. This study looked at the thinking process, motivation, and interest in solving mathematic problems. This research looked at three issues in detail: student explanations of DL features, student markers of lower and upper disabilities, and characteristics of students' arithmetic test responses. As a result, data from descriptive statistics using rate percentages and data from exploratory research were combined in this report. This research was conducted in Jember, East Java, Indonesia.

### **Participants**

The research subjects were 85 grade 10 vocational high school students, 51 of whom were male and 34 of whom were female. All students are given a math test that measures both their math and verbal ability in order to identify high-ability learners.

Table 1. Characteristics of MLD students

Characteristics	F	%
Gender		
Male	51	60
Female	34	40
Level of MLD		
Low	46	54.1
Middle	39	45.9
Total	85	100

Table 1 shows that out of 85 students, 60% are male and 40% are female. The students are chosen based on their level of disability, with 54.1 percent performing low and 45.9% performing middle. The findings are based on a working memory test and a math skills test.

**Instrument**

The MLD test and the interview guide are the two types of instruments used to collect data in this study. The MLD tests are divided into two parts: a check list to identify MLD students in the form of arithmetic abilities tests and working memory tests, and a second test to assess students' thought processes in the form of problem solving arithmetic problems and interview guidelines. The arithmetic problem solving consists of three question stories about daily life, whereas the interview guide contains an outline of the problem being asked, specifically about the students' thought process when working on the test questions that have been given. A structured interview is the second tool. This instrument is used to investigate in-depth information about the problem-solving process used by students during the learning process.

**Data Collection**

This research looked at the ways in which students with MLD solve math problems, specifically identifying the subjects of the study, followed by obtaining test results and transcripts. Thus, the data could concentrate on mental activity, such as analysis and computation, as it was taking place during the math test. The creative process involved four different levels of problem solving: understanding, formulating strategies, and implementing the solutions. This can be observed as a shift from disequilibrium to equilibrium, and back again to disequilibrium during the assimilation and accommodation. Eventually, after analyzing the data, conclusions were generally reached for the MLD solving of Mathematics problems.

**Test on Arithmetic**

Prior to the interview, data on arithmetic measures was gathered through a series of tests. The results of this project measured competence level of students by several measures, but also tracked different characteristics such as parent expectations, characteristics which were different for upper and lower levels, and minority students. so that numbers served as the data points were provided in the form of topics and topics were covered

in numeric form.

### ***Test on Problems Solving***

Researchers collected problem-solving tests by assigning a test to students and observing how students worked on the test. In this regard, the researchers gave out the test and divided the students into groups based on their level of competency. The procedure is divided into four steps, which are as follows: planning, implementation, observation, and reflection.

- a. Planning in the form of creating learning devices, specifically RPP (lesson plan) related to arithmetic learning; creating research instruments in the form of test questions and observation format of student activities; discussing observation format with partner teachers.
- b. Implementation, which is divided into eight stages: 1) The instructor begins the lesson by listing the learning goals that must be accomplished. 2) The instructor administers an initial examination, which consists of simple arithmetic calculations used to assess students' comprehension of arithmetic operations. 3) Assemble students into small groups of at least 4-5 students in a variety of ways. 4) Give each group worksheets in the form of story questions that incorporate arithmetic operations. 5) The teacher provides guidance on the procedures that the students must obey. 6) Students work together in groups to solve problems. 7) Students and teachers have a conversation about the findings of the study. 8) Students and teachers focus on the learning outcomes and come to a conclusion.
- c. Observations were made during the learning process, beginning with the assignment of students to form groups and ending with the conclusion of collaborative learning by students and teachers.
- d. Reflection, in the form of data processing by researchers obtained from observations at the observation stage of learning activities of students and teachers.

Students are given three sets of tests in order to measure their progress after they have met with the instructor three times. In this study, data was gathered by administering three-question arithmetic problem solving tests to two MLD students and conducting structured interviews at the same time. In addition to writing the results of their work, students were asked to explain the process of work verbally (think aloud) before proceeding with a structured interview to obtain in-depth information.

### ***Interview***

The interview results were primarily concerned with how students responded to their problem-solving process within the framework of MLD. In each stage of learning, students were required to provide verbal responses to confirm how they worked and performed their abilities. Because students were limited in their ability to explain their arguments and reasoning, the researchers did not request interviews that focused on information other than the tests. The results of the interview were recorded verbatim and transcribed so that they could be identified. The interview was conducted in groups of nine lower-level students and eight upper-level students. Each group was given a 20- to 25-minute interview.



## Data Analysis Techniques

The data used in this study were gathered using the combination of a descriptive statistic that estimates percentage of student productivity as well as a student-oriented productivity measure. The first analysis showed student performance on math, and personality traits the students claimed were representative of an MLD person. Second, it was used to show how the problem-solving process took place when students worked together in groups. Cresswell (2014) and Miles & Huberman offered a qualitative study (1994). The analysis began with the collection of data, proceeded to the second stage, where it was focused on data reduction, and then to the final conclusion. So the text and number were isolated and referred to in the collection stage. At the unit of analysis stage, a limited number of themes were identified. Only relevant data was used in the project. Each data were numbered and assigned a unique code for easy reference in the display stage. A source of theme analysis was also provided, so that you have one set of thematic samples to follow. Finally, each data was analyzed and verified to be 100% correct, and therefore, verified again to be final (Miles & Huberman, 1994).

## Results and Discussion

### Mapping on Students Competence

The findings of the studies show two examples of MLD performances in which students demonstrated their attributes. The first attribute characterizes eight behaviors that are used to identify students with learning disabilities. (1) Mathematical motivation, (2) Aptitude and interests, (3) Communication, (4) Trust to express an opinion, (5) Interaction with other students, (6) Self-confidence, (7) Problem-solving methods, and (8) Abilities to gain new knowledge are among the descriptors. The second feature defines the characteristics of LD students with low and middle ability (see Table 2).

Table 2. Students Performance

Indicators	Lower Competence N=46				Upper Competence N= 39			
	Low		Mid		Low		Mid	
	F	%	F	%	F	%	F	%
1. Motivation in mathematics	24	52.2	15	38.5	9	23.1	30	76.9
2. Aptitude and interests	40	86.9	6	2.2	11	28.2	28	71.8
3. Communication	38	82.3	8	17.4	15	38.5	24	61.2
4. Confidence to express opinion	28	60.9	18	39.1	15	38.5	20	51.3
5. Interaction with other students	27	58.7	12	26.1	7	17.9	32	82.1
6. Self-confidence	30	65.2	16	34.8	9	23.1	30	76.9
7. Methods of solving problem	25	54.3	21	45.7	11	28.2	28	71.8
8. Abilities to gain new information	28	60.9	18	39.1	15	38.5	24	61.2
Total	240	521.4	114	242.9	92	236	216	553.2
		65.2	14.3	30.4	11.5	29.5		69.2

In addition, student performance of lower and upper competence is identified by the general characteristics in demonstrating their classroom work. Table 3 shows how lower group and upper group demonstrate their attributes.

Table 3. The Characteristics of the Research' Subject

No.	Types of Characteristics	General Characteristics of Lower Students	General characteristics of upper students
1.	Motivation in Mathematics	Low tendency in motivation and needs	Moderate tendency of motivation and needs
2.	Aptitudes and interests	lack of aptitudes and interests in other fields	lack of aptitudes and interests in other fields
3.	Communication	exhibiting good communication skills, but using mainly Madurese in communicating	having difficulties in expressing themselves and frequently repeating words
4.	Confidence to express opinion	lack of confidence to ask and express opinion	Exhibiting fair confidence to ask and express opinion
5.	Interaction with other students	exhibiting confidence to interact with others, but prefer to be alone.	socializing with a small group of friends only, having difficulties in interacting with others and adapting.
6.	Confidence	Lack of confidence	Lack of confidence
7.	Methods of problem solving	Trial and error	Trial and error
8.	Abilities to gain new information	Frequently unable to understand new information that it has to be explained repeatedly	Frequently misunderstand new information.

### Results of Test

As stated in the methodology, the test is held at a vocational high school in Indonesia. There was an effort to apply LSLC in the classroom. Teachers identify a learning need in their students' targeted area of development. During the program, participants use existing evidence to seek, plan, teach, and monitor their own practices in ongoing discussions that is directed by experts. It was the purpose of the MLD student to classify MLD students. By the start of class, the students are already getting organized into groups. The teacher used participatory, non-confrontal learning. Aside from caring from one another, these groups can learn from each other. Students can come to class together and talk about a problem with the teacher thus a class can develop a learning community. We conduct a substantial research by sifting through a huge amount of conjecture. Figure 1 shows an example of the students' answers:

3. Adi memiliki persediaan buku tulis sebanyak 240 buku. Ia membeli lagi 8 ikat buku tulis, dimana setiap ikat berisi 15 buku tulis. Buku tersebut dibagikan kepada 24 anak Panti Asuhan. Apabila setiap anak mendapatkan buku tulis yang sama banyak, berapa buku tulis yang diterima setiap anak Panti Asuhan?

Penyelesaian

Diketahui:  $15 \times 8 = 120$  buku      total semua buku: 360

$$\begin{array}{r} 15 \\ 8 \\ \hline 120 \end{array}$$

$$\begin{array}{r} 240 \\ 120 \\ \hline 120 \end{array}$$

Ditanyakan: banyaknya buku yang diterima anak panti asuhan

Translation

3. Adi has 240 books. He bought 8 pack of book, where each pack consist of 15 books. All of the books that Adi bought is divided into 24 children in orphanage. If every children get the same amount of books, how many books that every children got?

Solution:

Known:  $15 \times 8 = 120$  books      the total number of book = 360

Question: the amount of book that the children gotten?

Figure. 1. Student's Test Answer

After the students get the test, we interviewed the student through think-aloud process. Here is the example of the interview results.

- P101001      Bagaimana Lut, bisa? (Peneliti mengajukan pertanyaan setelah subjek membaca soal dan terlihat kebingungan)
- S101001      Hmm... (Subjek hanya bergumam sambil membaca soal kembali)
- P101003      Pahami maksudnya?
- S101003      Enggak (Subjek menjawab dengan sangat yakin)
- P101004      Coba sekarang dibaca perlahan-lahan. Kemudian sampaikan apa maksudnya
- S101004      (Subjek mulai membaca kembali soal nomor 1)
- P101005      Bagaimana? Apa yang diketahui pada soal tersebut?
- S101005      Hmm... Adi memiliki persediaan 240 buku. Ia membeli lagi 8 pak buku dimana tiap pak nya terdiri dari 15 buku.

Translation:

- P101001      How is the test? Can you do it? (Researcher gives a question after the student read the problem and looks so confuse)
- S101001      Hmm... (The student just muttered while reading the question again)
- P101003      Do you get it?
- S101003      No sir (The student answered very confidently)
- P101004      Try now read slowly. Then convey what it means
- S101004      (Subject starts rereading question number 1)
- P101005      How is it? What is known about it?
- S101005      Hmm... Adi has 240 books. He bought 8 pack of book, where each pack consist of 15 books

Based on the interview and the results of the tests with the MLD criteria, we determined that there were 23 male students and 5 female students who were MLD. MLD subjects were presented by gender and then classified into MLD class groups based on standard deviations. The MLD student classifications are high, moderate, and low. Students in MLD who are classified as low class have the lowest level of arithmetic skills and working memory. Students from the lower classes (both male and female students) are chosen with the goal of having good communication skills, and they are then used as research subjects for thought processes. Figure 3 depicts the process of recruiting research subjects. Table 1 shows the other characteristics that can be observed on both study subjects.

S1 did not complete the assimilation process at the stage of understanding problems, whereas S2 has already understood the difference in the units used and is able to determine the total number of books. S1's accommodation mechanism is unable to decide what can be deduced from the dilemma and what is being questioned right away. S1 is unable to accurately quantify the total number of books because she does not understand the variations in the units used.

It's at the division stage of Devising Plans 1 that the assimilation process is able to tell you which operation to use to solve the problem. This class is able to determine the operation that was used to solve the problem, as previous problem was division. Subjects could not be accommodated. as far as S1 is concerned (0). The basic division and multiplication operations of S1 cannot be completed due to the lack of their accommodation for S1. Given an explanation about the three-digit division, he is unable to do two-digit subtraction, for example he falls short when he calculates 120 minus 24 During looking-back, the assimilation process didn't occur in both students The accommodations of both concluded by the subject aren't the calculations, however.

it has been discovered that when the subjects are taught about multiplication concepts and given examples of vertical addition, there exists an equilibrium state, in which case, wherein they can both effectively apply the concepts. Both the S2 and the same happen when two or three-digit vertical subtraction is done using guides: this also means that we have to think of a few subtraction facts vertically instead of dealing with fingers. At the end of the subject looks back and sees how their findings coincide with the final results from the calculation, the S2 is in an equilibrium state (see Figure 2a and Figure 2b).

The disequilibrium stage occurs to both study subjects. Even though they have understood the problems many times but are not aware of any inferences that can be drawn from them. In the second problem, S2 attempts to draw conclusions but falls short. The process of devising a strategy also occurs in disequilibrium. They are unable to discern which strategy should be applied to their current problems. When presented with the second problem, S2 identifies the strategy that's employed, which is division. However, once she has been asked why, she cannot elucidate. Both S1 and S2 arrive at different conclusions after performing calculations on the first two data sets of results. There is more imbalance in the assimilation than there is in the final state of being integrated.

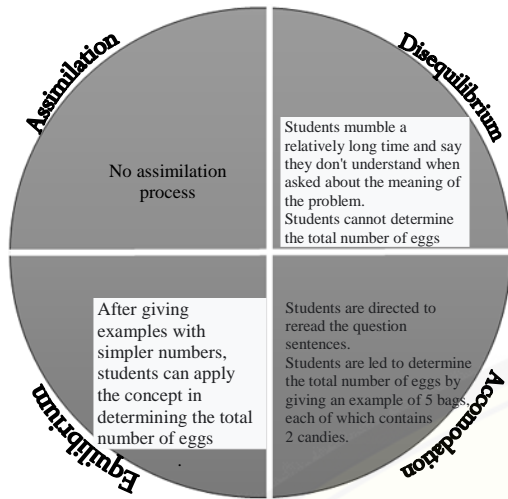


Figure 2a. S1 Thinking Process in Problems Solving

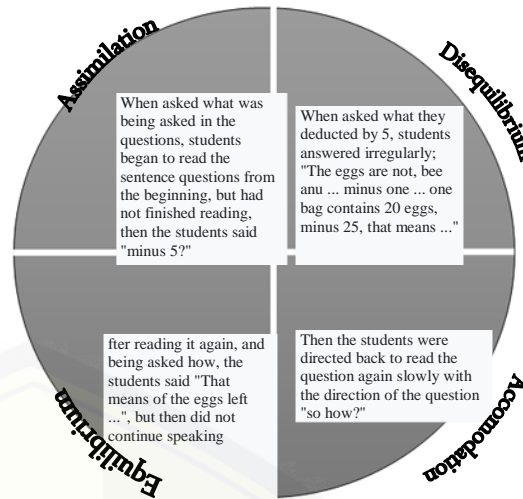


Figure 2b. S2 Thinking Process in Problems Solving

This study found evidence that MLD students exercise their abilities in a restricted manner, and that issues relating to learning disabilities arise during their learning process, necessitating a discussion of several findings. On the one hand, consensus is reached in the field of teaching and learning for MLD students. Problems in LD can emerge from students' internal abilities, as they have disordered skills and are unable to perform competently (Garnett, 2021; LDA, 2021; Bicer, 2021). As a result, a teaching program explicitly designed to identify MLD is needed, as well as curriculum creativity to provide appropriate teaching materials and learning processes (Utomo, 2021; Kunwar, Shrestha & Sharma, 2021; LDA, 2021; Kemp, Aubrey & Vidakovic, 2021; Garnett, 2021; Lee & Lee, 2020).

Through much of our research, we found 8 factors that influence performance. They are (1) desire in mathematics, (2) belief in their ability, (3) willingness to communicate, (4) reassurance in their abilities, (5) knowledge, and (6) interest in additional training and (their progress). We will tell you that the challenge is important to accomplish, but we can stress that good process is equally as important when you learn a new strategy (LDA, 2021; Garneet, 2021; Kemp, Aubrey & Vidakovic, 2021).

Our results also show that the disequilibrium state causes significant problems and plays an important role in MLD students' thought processes. This study demonstrates that the process of thinking should be prioritized during the problem-solving stage. In the thought process of students with MLD, the difference between the assimilation and accommodation processes (disequilibrium) occurs more often than the equilibrium state. Learning deficiencies such as dyscalculia, dysgraphia, dyslexia, and oral/written language deficits are critical in the treatment of LD (Kunwar, Shrestha & Sharma, 2021; Garnett, 2021; Utomo, 2021; LDA, 2021; Kemp, Aubrey & Vidakovic, 2021). These results are in line with Murphy et al., (2007), who state that students with MLD have impaired cognition, indicating an arithmetic deficiency. Garnet (2021) suggested the same suggestion, namely: (1) inspiration in the form of interactive and improving activities, (2) well-distributed minor practices, (3) mastery of multiple minor facts at the same time, (4) is on "reverses" or "turnarounds," (5) student

self-charting of development, and (6) not only work, but also teaching (Susanto, Hobri & Nugrahaningsih, 2021; Lee & Lee, 2020).

Additionally, this study argues that which problem does the student struggles with the most, math difficulty, being defined as MLD, should be included. It is noted that dysgraphia, or dyslexia, and issues with written or oral language ability, are also included in the scope of this study. According to previous studies, how L stands out as a single-origin developmental challenges, LD-specific teaching strategies and programs, as well as attitudes towards learning, both of the community and school administrators, focus on LD, are strongly desired.

## **Conclusion**

In conclusion, MLD students use a prospective learning paradigm as well as psychological factors to solve their problems. In general, lower and upper MLD students express a desire to be active in the learning process, which necessitates commitment and serves as a model for success. Students in the stage of understanding problems, in particular, undergo disequilibrium as a result of their inability to independently comprehend the expected meanings of the arithmetic problems. Despite attempts to solve arithmetic problems independently, confusion is almost always the result. Once subjects have grasped the concepts, such as vertical addition, subtraction, and multiplication methods, they will help them to accept and assimilate the information as the subjects work through subtraction. As a result, there is a disequilibrium as the subjects are learning due to the confusion with units of measurement. Plans are carried out when the subject is doing two or three digit division the subjects have not yet comprehended the division concept, which entails removing the divisor until there is nothing left (0). While the subjects are applying the concept to 100 without any form of assistance and while they are struggling with basic arithmetic (e.g. subtraction), the disequilibrium occurs. At this stage, the subjects are able to look back on their work and draw their expected conclusions. However, the subjects are unfamiliar with the measurement system.

## **Recommendations**

This study is limited in that it has a large number of participants, but the in-depth analysis is relatively rough. In order to overcome this, the following recommendations are made. First, educators must be aware of students who have low math scores in order for these students to be identified as MLD students. MLD children can comprehend problems with the assistance of others. Second, in order to address the disequilibrium of MLD students, the problems presented to MLD students must be more detailed, as their comprehension is not as simple as that of other children. As a result, it is possible for other researchers to develop special devices for MLD children.

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