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Reflective thinking focuses of intellectual disability students in solving mathematics problems involving the context of traditional ceremonies

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Abstract

Students' mathematical reflective thinking skills are not yet fully developed, especially among students with disabilities. To address this issue, culture-based problems can be applied as a learning approach. This study aims to describe students' reflective thinking skills in solving problems related to Maluku cultural contexts, such as traditional events. This research uses a qualitative approach. The subjects were two students with disabilities selected based on specific criteria from a State Junior High School in Maluku Province, Indonesia. The instruments used were two problem-solving tasks and interview guidelines. Data analysis involved data reduction, presentation, and drawing conclusions. The results showed that one student was able to solve the problem well, demonstrating reflective thinking. However, the other student faced difficulties, especially in the reacting stage, where they struggled to understand the given problems, which hindered the overall reflective thinking process. The progress shown by one student indicates that culture-based problems offer positive benefits for students with intellectual disabilities. Therefore, schools are encouraged to integrate Maluku culture-based content into the curriculum and apply strategies that foster reflective thinking.

Keywords: inclusive education; intellectual disabilities; Maluku culture; reflective thinking

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Introduction

Mathematics is a broad and deep discipline that examines various aspects such as numbers, structure, space, change, and the complex relationships between these concepts. Mathematics focuses not only on theory but also on its practical application in everyday life, where mathematics is needed in all aspects of life as an important tool that helps individuals in solving various problems, both complex and straightforward (Awaji et al., 2024; Drijvers & Sinclair, 2024; Jamil et al., 2024; Mamurov et al., 2024). Given the important role of mathematics in the development of science and technology, a solid mastery of mathematics is needed from an early age so that children are not only able to understand basic concepts but also able to apply them in life to develop technology that will shape the future (Friantini et al., 2020). Mathematics education is introduced but taught continuously and systematically from primary to senior high school so that students have a strong foundation to understand and explore more complex mathematical concepts at higher levels (Matitaputty et al., 2024). Thus, in its learning, the emphasis on the relationship between the use of mathematics in daily activities receive less atention (Laurens, 2025).

In line with the importance of mastering mathematics by Nabila et al. (2024), every element in the educational community has a crucial role in creating a friendly, supportive, and inclusive learning environment. (Yulaini et al., 2025) also supports the statement that the learning process at all levels of education needs to emphasize the skills to obtain, select, and process information or knowledge effectively and efficiently through observation or experimentation. This becomes even more relevant when considering the needs of students with unique challenges, such as students with intellectual disabilities, who require more adaptive and effective teaching approaches to understand mathematical concepts.

Intellectual disability (*Tunagrahita*) comes from the word "*Tuna*" which means "Loss". In contrast, "*Grahita*" comes from the word "*Nggrahita*" which means "Mind", so tunagrahita (Intellectual Disability) can be interpreted as a lack of thinking power (Triana & Nadhirah, 2024). According to (Harahap, 2021), intellectual disability is a condition of stalled or incomplete mental development, characterized by skill defects throughout the developmental period, which affects all aspects of intelligence, so a person is said to have intellectual disabilities if his/her level of intelligence is below average, resulting in difficulty in adjusting to the environment and unable to understand abstract concepts and academic subject matter. Tunagrahita is divided into three classes, namely mild mental retardation, moderate mental retardation, and severe mental retardation (Yunita et al., 2020).

The main obstacle faced by students with intellectual disabilities in the learning process is limited intelligence due to limited thinking functions, resulting in difficulty in understanding the subject matter, coupled with a lack of motivation to learn so that they have difficulty completing lessons and spend more time playing or staying silent (Aini & Harsiwi, 2024; Rahmawati et al., 2021). Students with intellectual disabilities often face challenges in the learning process, including understanding abstract math concepts. Therefore, an appropriate mathematics learning approach is needed to support their academic development (Ariani et al., 2023). In this context, the reflective thinking process becomes an important tool for educators and learners to evaluate the effectiveness of learning methods and help intellectually disabled learners realize their thinking process to overcome difficulties and improve their understanding of mathematics concepts.

Thinking skills are important in ensuring the implementation of mathematics learning objectives, especially higher-level thinking skills such as logical, analytical, critical, creative, and reflective thinking skills (Ratnasari & Nurhidayah, 2020). The importance of reflective thinking in mathematics lies in individual skills to identify and solve problems using knowledge and experience related to the problem at hand (Kholid et al., 2024). The same thing is also explained by Junaedi et al. (2022) and Trisnani (2020) that reflective thinking is also an active activity, and it takes effort to explain something and connect ideas to get deep meaning in applying the right strategy. Through it, one can identify mistakes, analyze various approaches, and learn from previous experiences.

Students must go through certain phases to assess their level of reflective thinking. There are phases that learners must go through to determine their level of reflective thinking. According to (Surbeck et al., 1991), reflective thinking includes three phases: (1) reacting (reflective thinking for action), where learners can identify what is known, determine what is asked, establish the relationship between the known information and the question, and evaluate whether the known information is sufficient to answer the question; (2) comparing or elaborating (reflective thinking for evaluation), in this phase learners can explain the strategies they have used and assess their adequacy in solving the problem. Learners can also identify and explain strategies that are considered more effective, analyze relationships or connections (such as similarities and differences) between current problems and problems that have been faced; (3) Contemplating (reflective thinking for critical inquiry), learners solve problems using predetermined strategies, detect errors in answers, correct and explain these errors, and draw conclusions from the problem-solving process.

Students' reflective thinking abilities are essential in the mathematics learning process. However, students have not maximally fulfilled their' mathematical reflective thinking abilities; this is still very significant, supported by the results of questionnaire analysis, which shows the percentage of students' reflective thinking abilities that reach the less reflective category is almost 50% (Faradila et al., 2020; Fedinafaliza et al., 2021; Ningrum & Fauziah, 2021). In addition, Samad et al. (2020) explained that students' reflective thinking abilities on the material of linear equations of one variable are still low. This is evidenced by the learning process, where students find it challenging to solve various math problems in the practice process. The exam results also show that many students get low scores. Some of the factors that influence the low mathematical reflective thinking skills of students include students still thinking that learning mathematics is difficult to understand, students' interest in learning mathematics is still low, mathematics problems being less varied, students are also not optimal in analyzing and communicating problems well to solve, this is because students are very fixated on the examples given by the teacher so that when students find different problems they feel unfamiliar and cannot solve these problems (Febrianty et al., 2024).

It should be noted that although students with intellectual disabilities have low thinking abilities, they still have the potential to develop and improve the quality of their thinking process. Students with intellectual disabilities can be given a stimulus to train their thinking skills so that they can develop them (Indriyani, 2024). Of course, teachers' efforts to improve the thinking processes of students with intellectual disabilities are not easy. One alternative to the complexity of the problem is to analyze reflective thinking ability through contextual learning immediately.

There are several types of contextual learning, one of which is culture-based learning (Mutamam et al., 2022). In mathematics learning, the utilization of cultural contexts such as dance (Apsari & Abrahamson, 2024; Mataheru et al., 2023), traditional food (Purba, 2024) or traditional houses (Meyundasari et al., 2024) to ideas, methods, and techniques developed by the community is expected to be an alternative to introduce the surrounding life to students. This research uses the context of local culture, namely traditional ceremonies. Many things are related to Maluku traditional ceremonies, including baileo and crazy bamboo dance. The word baileu (often written baileo) is a word in the Maluku language that has the same root as the Malay word bale or balai, which means a meeting place to discuss village (country) problems (Ayhuan et al., 2021). According to Balsala et al. (2024), baileo is the name for the traditional house of the Moluccan people, which is used as a place for traditional ceremonies related to the village community. This understanding shows that baileo is a physical manifestation of the village as a customary alliance (Ayhuan et al., 2021). Meanwhile, bamboo gila is a traditional dance of the Moluccan people that contains mystical elements and is only played during traditional ceremonies and can depict the identity of the Moluccan people who uphold the spirit of cooperation in social life (Harnisa et al., 2025). The context of the traditional ceremony begins with the construction of the Baileo traditional house and the accompaniment of the crazy bamboo dance. This context was chosen because it has mathematical elements, which can be used as teaching materials in training the reflective thinking abilities of students with intellectual disabilities.

Culture-based application is one method of learning mathematics involving local activities or culture, making it easier for students to explore their reflective thinking abilities (Hidayat & Linda, 2023). In addition, Wati and Affrida (2024) explained the sound effect of learning that integrates culture in presenting problems to intellectually disabled learners so that they can better understand the problems given and help the mathematics learning process. Therefore, teachers can present various mathematical problems by utilizing the cultural context of the surrounding area so that students can more easily understand and solve these problems. The problems described are related to the importance of giving problems within the context of traditional ceremonies on the material of linear equations of one variable to facilitate students in exploring their reflective thinking process.

Several studies have been conducted to help improve students' culture-based reflective thinking abilities, such as (Lin et al., 2025) research using experiential learning with generative AI as a learning aid, Santosa et al. (2025) research that uses a realistic mathematics education learning model based on hypothetical learning trajectories, and (Ambarwati et al., 2023) research that uses PMRI questions in the context of South Sumatra's identity ornaments. However, these studies were only conducted on regular students and have never been conducted on students with intellectual disabilities. In addition, many researchers have tried to improve the thinking skills of students with intellectual disabilities by applying interactive learning media on fractions, geometry, counting, and others (Ari et al., 2024; Derbissalova et al., 2023; Fauziyyah & Kumala, 2024; Rahmawati et al., 2021), utilizing digital learning technology (Khasawneh, 2024), TPCK-based learning by utilizing archipelago comics on social arithmetic material (Muqtafia et al., 2024), artificial intelligence (Alsolami, 2025), assistance in learning math with doratic media (Hidayatullah et al., 2020), and story problems (Bruno et al., 2024). From the many studies, no one has used a culture-based approach with a specific context on linear equations of one variable material. In contrast to previous studies, this research examines the stages of reflective thinking of students with disabilities in the context of traditional ceremonies on the material of linear equations of one variable.

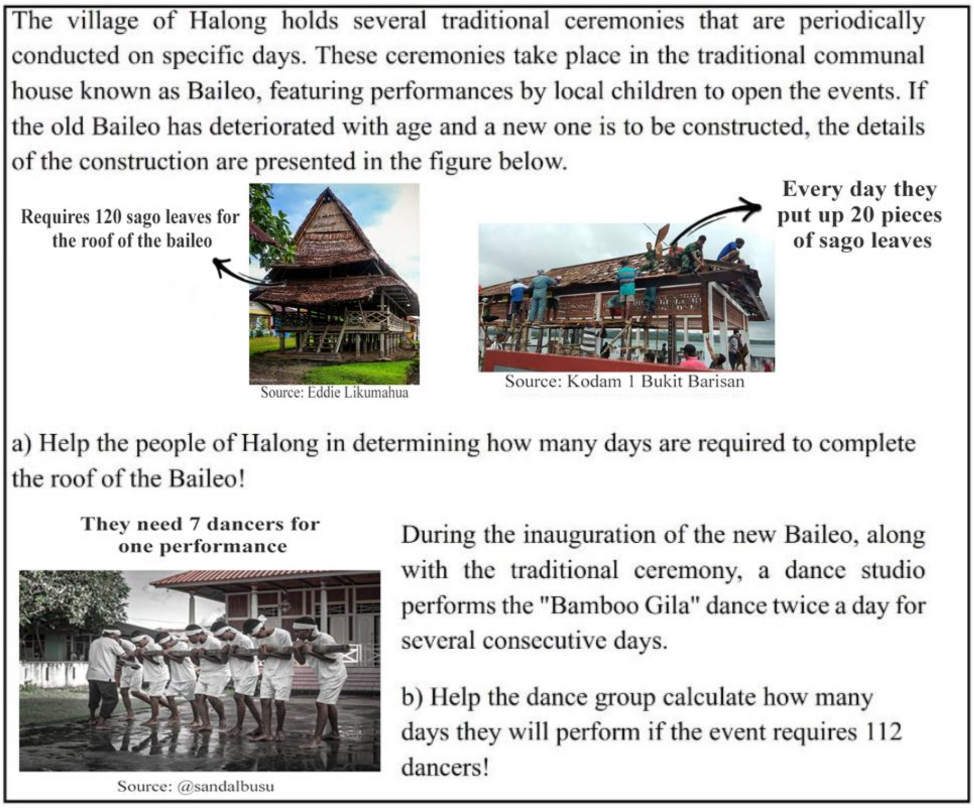
The purpose of this study is to analyze the focus of reflective thinking of students with intellectual disabilities in solving problems within the context of Maluku traditional ceremonies based on the stages of reflective thinking according to Surbeck et al. (1991). Hopefully, this research can be used as a reflection to help students with intellectual disabilities practice the reflective thinking process well. Therefore, the research question is, “How is the reflective thinking process of students in solving problems based on Maluku traditional events on the material of linear equations of one variable?”.

Methods

The type of research used is descriptive qualitative research. In terms of research objectives, this research aims to describe a situation or a phenomenon that occurs to obtain qualitative data (Creswell, 2009). The data source of this research is students with intellectual disabilities (*tunagrahita*). Greenspan and Switzky (2006) defines intellectual disability (*tunagrahita*) as a disorder whose intellectual function is generally below average, namely IQ 84 and below.

The subjects in this study were two female students with intellectual disabilities, aged 13-14 years, from a public junior high school in Ambon City, Maluku Province, Indonesia. Through some of the characteristics of intellectually disabilities students, according to (Napitupulu et al., 2022), namely 1) difficulty remembering things, 2) difficulty thinking logically, and 3) difficulty solving problems. These students were selected based on the suitability of diagnostic criteria, their ability to participate in mathematics learning, and the cumulative results of their mathematics scores. Ethical approval was obtained from the IM homeroom teacher, where the two students often forgot the material that had just been given and had difficulty determining a problem-solving strategy in mathematics and almost all existing subjects. Only two students in that class meet the criteria for intellectual disabilities.

The instruments used were problem-solving questions with two items in the form of descriptions and interview guidelines that two lecturers and a mathematics teacher had validated. The validation results show that this instrument is suitable for collecting research data. The problems given were designed using the context of Maluku traditional ceremonies, such as activities in traditional events that use baileo as a place to organize customs. As for the question indicators, as follows. 1) Students can calculate the number of days needed to complete the installation of the roof of the Baileo traditional house based on the number of materials needed and the installation speed per day, 2) Students can calculate the number of days required for a group of dancers, Bambu Gila, to fulfill the total number of dancers required in the Baileo opening ceremony by considering the number of dancers per performance and the frequency of performances per day. Figure 1 shows the questions given.


The village of Halong holds several traditional ceremonies that are periodically conducted on specific days. These ceremonies take place in the traditional communal house known as Baileo, featuring performances by local children to open the events. If the old Baileo has deteriorated with age and a new one is to be constructed, the details of the construction are presented in the figure below.

a) Help the people of Halong in determining how many days are required to complete the roof of the Baileo!

During the inauguration of the new Baileo, along with the traditional ceremony, a dance studio performs the "Bamboo Gila" dance twice a day for several consecutive days.

b) Help the dance group calculate how many days they will perform if the event requires 112 dancers!

Figure 1. Problem-solving task

The results of the answers of students with intellectual disabilities in each category will be analysed for their reflective thinking process. Table 1 below displays the stages of reflective thinking adapted from Surbeck et al. (1991).

Table 1. Reflective thinking stage

Reflective Thinking Stage	Description
Reacting stage (initial responses to the problem)	Students express their immediate feelings and thoughts about the given problem-solving task. Before solving the problem, students may write down and express their reactions to the problem.
Elaborating stage (exploring and expanding thinking)	At this stage, students provide future explanations, comparisons, or reasoning about their approach to solving the problem.
Contemplating stage (deep reflection on problem-solving and learning)	Students reflect on their understanding, the problem-solving process, and the broader implications or applications of the problem.

Data collection techniques included giving tests to 2 students with intellectual disabilities and semi-structured interviews to understand better their reflective thinking skills in solving problems with cultural contexts. The data analysis technique used is qualitative analysis of test and interview results.

Furthermore, the results of solving the problems will be asked to get more detailed information about their reflective thinking process through unstructured interviews. The stages of analysis carried out by the authors are based on the stages of analysis, namely providing problem-solving tasks for culture-based students, examining student work based on personal researcher analysis based on the phases of reflective thinking abilities, conducting interviews, reducing interview results and presenting the data obtained such as categorizing work and interview results based on answer keys and interview guidelines that have been categorized in the reacting, elaborating and contemplating phases and drawing conclusions.

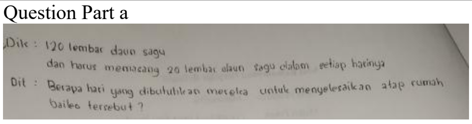
Results

In this section, data and analysis of the problem formulation are presented. This study identified key findings regarding the stages of reflective thinking of students with disabilities in solving Maluku culture-based problems (traditional ceremonies) on the material of linear equations of one variable: (1) reacting stage (initial response to the problem), (2) elaborating stage (exploring and expanding thinking), and (3) contemplating stage (deep reflection on problem-solving and learning). The following will explain the findings related to the reflective thinking process of students with intellectual disability.

Students with intellectual disabilities focusing on the "reacting" stage of reflective thinking

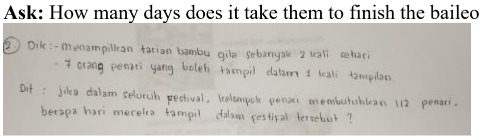
What is meant by the reacting stage is that Students express their immediate feelings and thoughts about the given problem-solving task. Before solving the problem, students may write down and express their reactions to the problems as an example taken from the answers to part a and part b on S1's answer sheet, as shown in Figure 2 below.

Question Part a



Dik : 120 lembar daun sagu
dan harus memasang 20 lembar daun sagu dalam setiap harinya
Dit : Berapa hari yang dibutuhkan mereka untuk menyelesaikan atap rumah baileo tersebut ?

Translation:
Known: 120 sago leaves must install 20 pieces of sago leaves each day
Question Part b
Ask: How many days does it take them to finish the baileo roof?



2. Dik : - menampilkan tarian bambu gila sebanyak 2 kali sehari
- 7 orang penari yang boleh tampil dalam 1 kali tampilan.
Dit : jika dalam seluruh pestival, kelompok penari membutuhkan 112 penari, berapa hari mereka tampil dalam festifal tersebut ?

Translation:
Known: Performing the Bambu Gila dance 2 times a day 7 dancers who can perform in 1 performance.
Ask: If the dance group needs 112 dancers for the whole event, how many days will they perform in the event?

Figure 2. S1's answers to questions parts a and b in the reacting phase

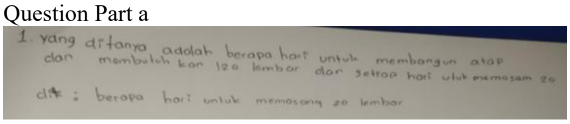
Based on the results of working on questions part a and b, subject S1 can think to act in this case, describing what is known and asked even though there is an error in part b, namely not describing other known information, namely the total number of dancers is 112 people. In the reacting phase, the rest, subject S1, can express his thoughts directly by presenting important information about the problem to be followed up. This is based on the statement expressed by S1 in the following interview excerpt.

R : What do you think about the problems in parts a and b?
S1 : I think the question is good because there is a picture so I can understand the question more easily. Part b is also similar to the question asked in part a.
R : Does this remind you of something you learned before?
S1 : Part a was about calculating how many days a person can finish a pack of candy. As for problem part b, it reminds me of part a because it is similar.
R : How do you feel about the solution?
S1 : I am satisfied because I can solve the problem by getting the final answer.

From the interview results, subject S1 can conclude that students show interest and enthusiasm for the problem, mainly because the picture accompanying the problem and its similarities with the previous problem makes it easier to understand. In addition, a good understanding of mathematical problems is also given by subject S1, mainly because the visualization in the problem helps clarify information and facilitate understanding. Subject S1 could also relate the problem to previous learning experiences, although simple, such as counting days in the context of candy consumption. Subject S1 was satisfied with the solution process because she had arrived at the final answer and could explain the steps coherently using her language.

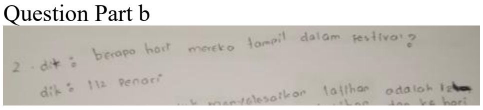
Furthermore, the findings on S2's response in answering questions parts a and b are shown in Figure 3 below.

Question Part a



Translation:
The question was how many days it would take to build the roof and required 120 sheets and each day to install 20 leaves.
Known: How many days to install 20 leaves
Known: 120 : 20

Question Part b



Translation:
Known: How many days are they on the show?
112 dancers

Figure 3. S2's answer to questions parts a and b in the reacting phase.

Based on the work on problem part a, subject S2 could not explain the information known from the problem but could explain what was asked. The same thing was found in part b's work; subject S2 could not explain the information given completely. The following are the results of interviews with subject S2, especially in the reacting phase, to support the analysis results.

R : What do you think about the problems in parts a and b?
S2 : That is good, but I am still wrong. Problem b, in my opinion, is similar to problem part a.

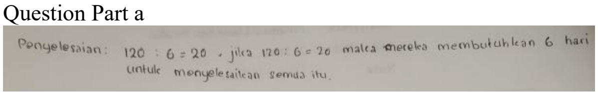
R : Does the problem remind you of something you learned before?
S2 I think so, but I forgot what the material was.
R : How did you feel when you solved it?
S2 : I found it challenging to solve the problem, so I was not satisfied with the result.
R : How is this similar or different from other problems you have solved before?
S2 : ... (Silence).

Based on the interview results, it can be seen that subject S2, in the reacting phase, still had difficulty in showing reflective thinking skills, so it was difficult to understand and solve the problem, even though the problem was considered interesting. Subject S2 showed an effort to recall the material that had been learned but had difficulty relating it. Frustration and dissatisfaction arose because he had not answered the question correctly; this shows that subject S2 realized the gap between what was expected and the results obtained.

Students with intellectual disabilities focusing on the "elaborating" stage of reflective thinking

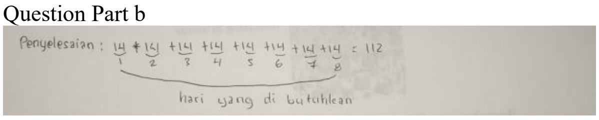
What is meant by the elaborating stage is that students provide future explanations, comparisons, or reasoning about their approach to solving the problem as an example taken from the work of part a and part b questions on S1's answer sheet, as shown in Figure 4 below.

Question Part a


Penyelesaian: 120 : 6 = 20 . jika 120 : 6 = 20 maka mereka membutuhkan 6 hari untuk menyelesaikan semua itu.

Translation:
Solution: 120 : 6 = 20, if 120 : 6 = 20, it took them 6 days to finish everything. So, they can install the baileo roof in 6 days.

Question Part b


Penyelesaian: 14 + 14 + 14 + 14 + 14 + 14 + 14 + 14 = 112
1 2 3 4 5 6 7 8
hari yang di butuhkan

Translation:
Solution: 14 + 14 + 14 + 14 + 14 + 14 + 14 + 14 = 112 days required. So 14 × 8 = 112. So, the days needed to perform the Bambu Gila dance is 8 days.

Figure 4. S1's answers to questions parts a and b in the elaborating phase.

Based on the work results, at the stage of elaborating or thinking to evaluate part a, subject S1 has been unable to make the existing problem into a linear equation of one variable. However, he can utilize the information listed in the problem to answer what is asked by the "manual method." In part a, subject S1 tested what number divides 120, resulting in 20. As for part b, subject S1 listed all the possible numbers of dancers in each performance. S1 adds 14 repeatedly until it reaches 112 and concludes that it takes 8 days to perform the Crazy Bamboo dance. The following are presented the results of interviews with subject S1, especially in the elaboration phase, to support the analysis results.

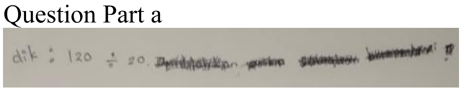
R : Can you explain what you did to solve parts a and b in your own words?
S1 : For part a, I first wrote down what I knew and asked about the problem. Then I thought, what number divides 120 and produces 20, which is 6? Then 6 becomes the number of days because 20 sago sheets are installed every day, so 6 days

> have 120 sago sheets installed. For part b, I used the solution strategy to find how many times 14 equals 112, which I applied by adding 14 repeatedly until I obtained the result 112.

Clearly, the strategy used is quite logical and reflects reflective thinking, which is to find the divisor of a certain number to find the solution. In addition, the strategy used is simple but effective to find the correct result.

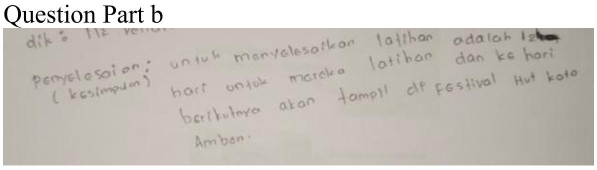
Furthermore, the findings on S2's response in answering questions parts a and b are shown in Figure 5 below.

Question Part a



Translation:
Known: 120 : 20

Question Part b



Translation:
Solution: To complete the rehearsal, it takes 12 days for them to rehearse and the next day to perform

Figure 5. S2's answer to questions parts a and b in the elaborating phase.

The results of S2's work at the elaborating stage show S2's thinking in elaborating or thinking for the evaluation of part a, subject S2 misunderstands the relationship between the amount of material and the time needed. She assumed all division problems follow the same structure without verifying their relevance. This was reflected in using an incorrect strategy, which resulted in an incorrect answer. Moreover, during the evaluation process of part b, subject S2 struggled to solve the given problem, as reflected in their work, which did not have a straightforward solution process. The following are presented the results of interviews with subject S2, especially in the elaborating phase to support the results of the analysis.

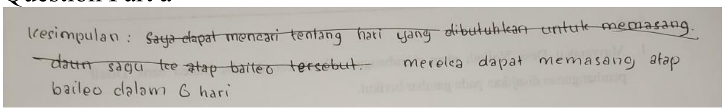
R	:	Can you explain what you did when solving parts a and b in your own words?
S2	:	For part a, I was confused. So, I assumed the total days to install the roof was 9. As for part b, it was more or less the same as what I did in problem a: I wrote down what was known and concluded that the total number of days they took was 12.
R	:	What strategy did you use that helped you decide to answer like that?
S2	:	In problem a, the strategy was that I divided 120 by 20; the result was 9. As for problem b, I could not determine the strategy.

Despite experiencing confusion, subject S2 can mention the steps by dividing the number of roofs by the number of installations per day, and this shows a basic numerical understanding even though it has not been fully formed. This shows the potential for reflective thinking, although it still requires a lot of guidance and reinforcement of basic concepts. In addition, the S2 subject has not developed an appropriate solution strategy and has difficulty explaining his thinking steps.

Students with intellectual disabilities focusing on the "contemplating" stage of reflective thinking

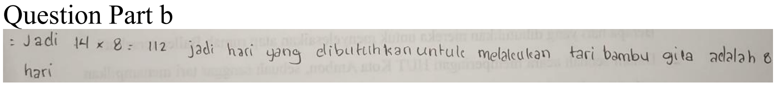
What is meant by the contemplating stage is that students reflect on their understanding, the problem-solving process, and the broader implications or applications of the problem as examples from the work of part a and part b questions on S1's answer sheet, as shown in Figure 6 below.

Question Part a



Translation:
Conclusion: They can install the baileo roof in 6 days.

Question Part b



Translation:
Conclusion: They can perform the Bambu Gila dance for 8 days.

Figure 6. S1's answers to questions parts a and b in the contemplating phase.

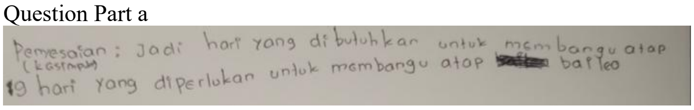
In the contemplating phase, subject S1 can solve the problem based on the strategy used and provide conclusions based on the solution results. Subject S1 can also detect errors, such as incorrect conclusions, to correct them with more precise and detailed conclusions. This means S1 can solve the problem well and conclude with the correct final answer. This is following the statement expressed by S1 in the following interview excerpt.

R : What challenges did you face, and how did you overcome them?
S1 : I did not find any challenges.
R : What did you learn from solving this problem?
S1 : Problems that look long are not necessarily challenging to solve; the important thing is that we understand the content of the problem so that we can use various problem-solving strategies, and these problems also train thinking in arithmetic.
R : How can you use this math concept in real life?
S1 : It can help me in buying, selling, and so on.

Despite not facing any significant challenges, subject S1 showed a positive and reflective attitude towards her learning process. In addition, subject S1 can also see the practical benefits of this material in everyday life, such as in the context of buying and selling, and realizes that this exercise helps practice numeracy skills. However, there are still shortcomings in writing down important information in detail.

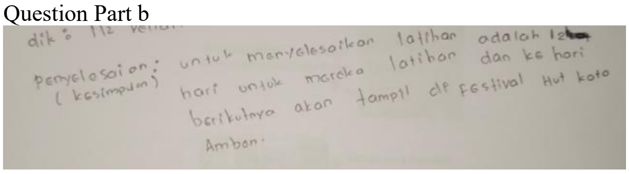
Furthermore, the findings on S2's response in answering questions parts a and b are shown in Figure 7 below.

Question Part a



Translation:
Conclusion: So the days needed to build the roof is 9 days.

Question Part b



Translation:
Conclusion: To complete the rehearsal it takes 12 days for them to rehearse and the nest day to perform.

Figure 7. S2's answer to questions parts a and b in the contemplating phase.

The results of the work of both problem part a and problem part b of subject S2 show failure in producing a well-structured and accurate conclusion. This is related to the failure experienced by the subject in the reacting phase and the elaborating phase. This is reinforced by the statement expressed by S1 in the following interview excerpt.

R : What did you learn from solving this problem?
S2 : ... (Silence).
R : What challenges did you face, and how did you overcome them?
S2 : I am still very confused, especially in finding the result of division, so I have to learn more about number operations.
R : How can you use this math concept in real life?
S2 : .... (silence)

The biggest challenge for subject S2 lies in the ability to perform number operations, especially division, which makes the reflective thinking process not fully developed. This resulted in subject S2 giving the wrong conclusion. Subject S2 realized this and expressed the need for teacher guidance to better understand the concept of number operations. This also shows the subject's motivation to strive to be better.

Differences in the focus of reflective thinking of subject S1 and Subject S2 in solving problems in each process of reflective thinking

In solving problems within the context of traditional ceremonies, S1 always focuses on each stage of reflective thinking. Subject S1 used a combination of the three focuses: (1) focus on the reacting phase, where S1 carefully writes down the known and questionable information; (2) focus on the elaborating phase, where S1 can reasonably determine the strategy used aided by the results of the reacting phase, and (3) focus on the reflecting phase where S1 can produce the correct final answer and is always aware of S1 understanding in solving the problem and its broader implications. This happened when the subject S1 solved the problem parts a and b. S1 focused on all stages of reflective thinking.

In answering each item of question based on Maluku culture, S2 did not always focus on the complete stages of reflective thinking. In contrast to the focus on S1, S2 could not combine the three focus stages of reflective thinking because many errors still occurred. The following is a brief description related to the findings of the reflective thinking process of subject S2: (1) not too focused on the reacting phase because he could not explain the known information and only explained the information asked, (2) did not focus on the elaborating phase because of the lack of focus on the reacting phase which resulted in subject S2 having difficulty in determining the right strategy in problem-solving, and (3) slightly focused on the reflecting phase because subject S2 could think and realize the mistakes made but was still wrong in concluding the final answer. Overall, the inability to combine the focus of S2's reflective thinking stages can illustrate the lack of development of reflective thinking skills of students with disabilities. The following is a brief description of the differences in the focus of reflective thinking of the two subjects presented in Table 2 below.

Table 2. Differences in S1 and S2 reflective thinking stages

Subject S1	Reflective Thinking Phases	Subject S2
Focus on the reacting phase (carefully record the information that is known and what needs to be sought)	Reacting	Less focus on the reacting phase (unable to present known information and only convey the information asked)
Focus on the elaborating phase (able to design the right strategy by utilizing the information obtained from the reacting phase).	Elaborating	Did not focus on the elaborating phase (lack of concentration on the reacting phase, thus having difficulty in choosing the appropriate strategy to solve the problem)
Focus on the reflecting phase (able to provide the correct final answer and still realize the level of understanding in solving the problem and consider the broader impact)	Reflecting	Little focus on the reflecting phase (able to think and realize the mistakes that occurred, but still wrong in concluding)

Overall, the combination of the focus on the stages of reflective thinking shown by S1 can provide a positive overview of the development of reflective thinking skills in students with intellectual disabilities. This shows that with the proper attention to each stage, students with intellectual disabilities still have the potential to improve their reflective thinking abilities. In contrast, S2's inability to combine focus on the stages of reflective thinking reflects a lack of development of reflective thinking ability, which indicates the need for more effective assistance and learning strategies to help these students.

Discussion

The responses of the two students showed significant differences. In the reacting phase, Subject S1 could identify the known and questionable information in the problem, and express initial thoughts clearly, although there were still errors in understanding all the data. In contrast, subject S2 cannot identify the known information completely, although it can mention what is asked in the problem. This aligns with the initial stages of reflective thinking in solving problems, namely, students can clarify the problem or task to be solve (McGregor, 2007). Reflective thinking is characterized by students' responses to explain what they have done and communicate their ideas in solving mathematical problems (Hamzah et al., 2024; Hasanah et al., 2025; Kholid et al., 2024). Alnfiai et al. (2025) also noted that students with cognitive disabilities have memory and task completion challenges. In addition, pictures and the similarity of problems with previous learning experiences helped S1 understand through concrete visualization and fostered his enthusiasm in solving problems. This is in line with the opinion of Garderen and Montague (2003) and Park (2022) that students with learning difficulties tend to use pictorial representations to solve mathematical problems. Meanwhile, S2 showed frustration due to the mismatch between results and expectations, indicating an initial awareness of his thought process. However, this could not encourage S2 to consider other strategies and re-evaluate her answers. This condition is an opportunity to encourage individuals to develop reflective thinking and find solutions (Hong & Choi, 2011; Kholid et al., 2020). This is explained by Marrus and Hall (2017) that students with intellectual disabilities can experience behavioral problems, especially frustration due to their inability to solve problems.

Furthermore, in the elaboration phase, the two subjects showed different reflective thinking abilities by selecting solution strategies. Both students are considered able to explore and expand their thinking. This is in line with the opinion of Muntazhimah et al. (2021) that students' reflective thinking in solving problems helps them make the right strategy in solving math problems. Although not yet able to convert the information in the problem into a one-variable linear equation, S1 can utilize the available data to answer the question with the method he developed himself. At this stage, students can apply new knowledge and develop strategies to deal with complex situations (Kholid et al., 2020; Nursupiamin et al., 2025). The strategic approach used by S1 reflects basic conceptual understanding and a systematic approach that shows engagement in evaluating information. This aligns with the stages of reflective thinking developed by Kholid et al. (2020), which suggests that effective reflection in problem solving involves thinking about how to consider alternative ways to further decide on the strategy or tactics to be used. In contrast, subject S2 showed limitations in elaborating the problem due to errors in understanding the relationship between the available data. However, S2 mentioned the steps of thinking verbally, indicating a basic numerical understanding. This aligns with the findings of Suryadi and Armanto (2023), who found that verbal students could recognize numbers and number series quite well.

Both subjects in the reflecting phase showed different abilities. In the reflecting phase, students reflect on their understanding, problem-solving process, and broader implications or applications (Surbeck et al., 1991). Subject S1 showed the ability to reflect on the problem-solving process as a whole, including evaluating the strategies used and drawing more appropriate conclusions after realizing the error in the initial answer. This is in line with what McGregor (2007) and Salido and Dasari (2019) found, that effective reflection in the development of problem solving after implementing the chosen strategy approach is to reflect on the work process towards success or failure in finding solutions. In addition, S1 solves the problem correctly and can relate the learning material to everyday life, such as buying and selling activities, and realizes the benefits of the exercise in improving numeracy skills. This indicates the existence of a developed metacognitive awareness. This is in line with the findings of Toraman et al. (2020) that there is a strong, significant positive correlation between reflective thinking towards problem solving and metacognitive awareness. In addition, this finding aligns with the opinion of Ariyanto et al. (2024) that an individual with high mathematical resilience can fulfill all three phases of reflective thinking. On the other hand, subject S2 has not been able to provide an accurate and structured conclusion. This is due to the failure in the previous phases (reacting and elaborating), especially in performing the division operation, which impacts the inhibition of the reflection process. This aligns with the findings of Ariyanto et al. (2024), who stated that students who are less resilient in mathematical problem solving can only react. Nevertheless, subject S2 showed awareness of his limitations and expressed the need for teacher assistance to understand the concept more deeply. This is in line with the findings of (Ersözlü & Arslan, 2009), which state that the teacher's role as a guide helps students' reflective thinking ability to solve a problem.

Although both subjects showed different reflective thinking at each stage, this study underlines the important role of reflective thinking in improving students' ability and understanding in solving problems using problems that are close to students' lives. Reflective thinking helps students connect with prior knowledge after analyzing phenomena or situations from the given problem (Alghafri & Roshdi, 2025). Whereas students' reflective thinking skills play a key role in the formation and preparation of learning strategies (Aydoğmuş & Şentürk, 2023), and mathematics learning will be more interesting if aspects of the cultural context around students are involved (Ratumanan et al., 2023). Unfortunately, teachers have not involved students with disabilities in real-world contexts for students with disabilities (Evanciew, 2003; Le Fanu et al., 2025; Martin et al., 2025; Vodičková et al., 2023), limiting their opportunities to build meaningful connections and higher-order thinking.

Conclusion

This study analyzed the three main focuses of reflective thinking stages of students with disabilities in understanding problems in the context of Maluku traditional ceremonies. Subject S1 showed better ability in all three phases: reacting, elaborating, and reflecting through identifying information, using logical strategies, and evaluating and correcting errors independently. In contrast, subject S2 is still at the reflective stage of development with limitations in the three stages of reflective thinking, which include limitations in understanding information, designing strategies, and drawing conclusions; however, subject S2 has shown motivation and awareness of the need for guidance.

This study also has its limitations in that the small sample size, which only focused on two subjects, limits the generalizability of the findings, so it cannot comprehensively represent the reflective thinking ability of all students with disabilities in Maluku. Nonetheless, this study is important as it highlights the importance of integrating elements of local culture into mathematics learning to promote cognitive engagement and cultural identity that can support students' reflective thinking processes. Beyond the specific findings, this study provides insights into the role of reflective thinking in mathematics problem solving as an important component of metacognitive awareness that can be linked to culture-based mathematics learning across different student profiles. Building on these insights, this study also encourages teachers to design culture-based teaching materials that promote reflective and critical thinking skills, thereby equipping students to face the challenges of digitalization.

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Author Contributions

Maeya Serang: Writing - original draft, Writing - review & editing, and formal analysis; **Tanwey Gerson Ratumanan:** Review, validation and supervision; **Christi Matitaputty:** Conceptualization, writing – review & editing, visualization; formal analysis and methodology; **La Moma:** Validation and review.

References

Aini, Q., & Harsiwi, N. E. (2024). Analisis permasalahan anak berkebutuhan khusus tunagrahita di SLB Karya Bhakti Surabaya [Analysis of the problems of children with special needs of tunagrahita in SLB Karya Bhakti Surabaya. *Multidisciplinary Indonesian Center Journal (MICJO*, *1*(3), 1498–1504. https://doi.org/10.62567/micjo.v1i3.182

Alghafri, A. S. R., & Roshdi, M. A. I. D. (2025). The Extent to Which Reflective Thinking Skills Are Included in the Content of Mathematics Textbooks for the 4th Grade in the Sultanate of Oman. *Journal of Curriculum and Teaching*, *14*(1), 67. https://doi.org/10.5430/jct.v14n1p67

Alnfiai, M. M., Alsudairy, N. A., Alharbi, Ibrahim, A., Alotaibi, N. N., & Alnefaie, S. M. M. (2025). Cognitive augmentation: AI-enhanced tools for supporting individuals with cognitive disabilities. https://doi.org/10.1007/s10339-025-01258-9

Alsolami, A. S. (2025). The effectiveness of using artificial intelligence in improving academic skills of school-aged students with mild intellectual disabilities in Saudi Arabia. *Research in Developmental Disabilities*, *156*, 104884. https://doi.org/10.1016/j.ridd.2024.104884

Ambarwati, B., Zulkardi, Z., & Susanti, E. (2023). Kemampuan berpikir reflektif siswa dalam menyelesaikan soal PMRI konteks ornamen jati diri Sumatera Selatan [Students' reflective thinking skills in solving PMRI problems in the context of South Sumatra's identity ornaments. *Delta-Pi: Jurnal Matematika Dan Pendidikan Matematika*, *12*(1), 25–37. https://doi.org/10.33387/dpi.v12i1.5455

Apsari, R. A., & Abrahamson, D. (2024). Dancing geometry: imagining auxiliary lines by reflecting on physical movement. *International Journal of Mathematical Education in Science and Technology*, 1–28. https://doi.org/10.1080/0020739X.2024.2427099

Ari, A. T., Tangke, D. M., Andriany, D., & Leleury, C. M. (2024). Penerapan media pembelajaran interaktif bagi anak disabilitas di SLB Negeri Kota Ambon [Application of interactive learning media for children with disabilities in SLB Negeri Ambon City. *Abdimas: Papua Journal of Community Service*, *6*(1), 25–30. https://doi.org/10.33506/pjcs.v6i1.2899

Ariani, W., Rahmi, A., & Anami, C. (2023). Peranan manajemen pendidikan khusus dalam pembelajaran matematika bagi peserta didik dengan hambatan intelektual di SLB Negeri Bontang Kalimantan Timur [The role of special education management in learning mathematics for students with intellectual disabilities at SLB Negeri Bontang, East Kalimantan. *Jurnal Review Pendidikan dan Pengajaran (JRPP*, *6*(3), 1622–1629.

Ariyanto, L., Supandi, S., & Kusumaningsih, W. (2024). Students' Reflective Thinking Profiles in Problem-Solving Based on Mathematical Resilience. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(3), 849–860. https://doi.org/10.31980/mosharafa.v13i3.1435

Awaji, B. M., Abdel-Hamid, R. H., Khalil, I. A., & Prahmana, R. C. I. (2024). Mathematics teachers' practices in light of the effective teaching practices. *Infinity Journal*, *14*(1), 1–20. https://doi.org/10.22460/infinity.v14i1.p1-20

Aydoğmuş, M., & Şentürk, C. (2023). An investigation into the predictive power of reflective thinking on learning strategies. *Reflective Practice*, *24*(2), 210–223. https://doi.org/10.1080/14623943.2022.2158796

Ayhuan, V. V., Souisa, N. N., & Hukubun, M. (2021). Alam sebagai Baileo kehidupan: Suatu kajian teologi [Nature as the Baileo of life: A theological study. *ARUMBAE: Jurnal Ilmiah Teologi dan Studi Agama*, *3*(2), 122–141. https://doi.org/10.37429/arumbae.v3i2.702

Balsala, S., Pattiasina, J., & Ima, W. (2024). Sejarah baileo baihata kapalatu dan fungsinya dalam kehidupan masyarakat adat Negeri Ameth di Pulau Nusalaut Kabupaten Maluku Tengah [The history of baileo baihata kapalatu and its function in the life of the indigenous people of Negeri Ameth on Nusalaut Island, Central Maluku Regency. *Lani: Jurnal Kajian Ilmu Sejarah dan Budaya*, *5*(1), 39–49. https://doi.org/10.30598/Lanivol5iss1page39-49

Bruno, A., Polo-Blanco, I., Vaerenbergh, S., Fernández-Cobos, R., & González-López, M. J. (2024). Strategies for solving multiplicative problems using a conceptual model-based problem-solving approach. A case study with a student with autism spectrum disorder. *ZDM – Mathematics Education*, *56*(6), 1239–1256. https://doi.org/10.1007/s11858-024-01568-w

Creswell, J. W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches* (3rd ed.). Sage Publications, Inc.

Derbissalova, G., Shayakhmetova, A., Avagimyan, A., & Pyanova, E. (2023). Multimedia applications in special education: new opportunities for the developing of cognitive processes of children with intellectual disabilities. *Multimedia Tools and Applications*, *83*(16), 49707–49721. https://doi.org/10.1007/s11042-023-17512-1

Drijvers, P., & Sinclair, N. (2024). The role of digital technologies in mathematics education: purposes and perspectives. *ZDM – Mathematics Education*, *56*(2), 239–248. https://doi.org/10.1007/s11858-023-01535-x

Ersözlü, Z. N., & Arslan, M. (2009). The effect of developing reflective thinking on metacognitional awareness at primary education level in Turkey. *Reflective Practice*, *10*(5), 683–695. https://doi.org/10.1080/14623940903290752

Evanciew, C. E. P. (2003). Preparing technology education teachers to work with special needs students; technology education programs typically rely on active, hands-on learning in order to provide students" real-world" experiences. *The Technology Teacher*, *62*(7), 7–10.

Faradila, L., Wibowo, T., & Purwoko, R. Y. (2020). Analisis kemampuan berpikir reflektif matematis pada siswa dengan gaya belajar visual-kinestetik [Analysis of mathematical reflective thinking skills in students with visual-kinesthetic learning styles. *Maju*, *7*(2), 502109.

Fauziyyah, A. N., & Kumala, F. Z. (2024). Pengembangan media pembelajaran interaktif berbasis powerpoint untuk meningkatkan kemampuan pemahaman matematis siswa tunagrahita kelas VIII SLB C Yakut Purwokerto [Development of interactive learning media based on powerpoint to improve the mathematical understanding ability of students with disabilities class VIII SLB C Yakut Purwokerto. *Jurnal Karya Pendidikan Matematika*, *11*(2), 67. https://doi.org/10.26714/jkpm.11.2.2024.67-76

Febrianty, E. D., Herman, T., & Pauji, I. (2024). Penerapan model pembelajaran direct instruction terhadap kemampuan berpikir reflektif matematis siswa [Application of direct instruction learning model to students' mathematical reflective thinking ability. *Jurnal Analisa*, *10*(1), 13–25.

Fedinafaliza, F., Mahdian, M., & Irhasyuarna, Y. (2021). Meningkatkan kemampuan berpikir reflektif dan hasil belajar melalui implementasi model FPOEIL [Improving reflective thinking skills and learning outcomes through the implementation of the FPOEIL model. *JCAE (Journal of Chemistry And Education*, *4*(2), 58–66. https://doi.org/10.20527/jcae.v4i2.623

Friantini, R. N., Winata, R., Annurwanda, P., Suprihatiningsih, S., Annur, M. F., Ritawati, B., & Iren. (2020). Penguatan konsep matematika dasar pada anak usia sekolah dasar [Reinforcement of basic math concepts in primary school-age children. *Jurnal Abdimas Bina Bangsa*, *1*(2), 276–285. https://doi.org/10.46306/jabb.v1i2.55

Garderen, D., & Montague, M. (2003). Visual-spatial representation, mathematical problem solving, and students of varying abilities. *Learning Disabilities Research & Practice*, *18*(4), 246–254. https://doi.org/10.1111/1540-5826.00079

Greenspan, S., & Switzky, H. N. (2006). Forty-four years of AAMR manuals.

Hamzah, N., Zakaria, N., Ariffin, A., & Rubani, S. N. K. (2024). The effectiveness of collaborative learning in improving higher level thinking skills and reflective skills. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, *42*(1), 191–198. https://doi.org/10.37934/araset.42.1.191198

Harahap, F. (2021). Perbandingan algoritma K means dan K medoids untuk clustering kelas siswa tunagrahita. *TIN: Terapan Informatika Nusantara*, *2*(4), 191–197.

Harnisa, S., Kapitanhitu, R., & Urlialy, G. M. (2025). Tarian cakalele dalam masyarakat negeri Hila kecamatan Leihitu kabupaten Maluku Tengah [Cakalele dance in the community of negeri Hila, Leihitu sub-district. *Central Maluku district]. Lani: Jurnal Kajian Ilmu Sejarah dan Budaya*, *6*(1), 70–80.

Hasanah, N. R., Turmudi, T., Juandi, D., & Roesdiana, L. (2025). Enhancing students reflective thinking through outdoor play and game-based contextual learning. *Retos: Nuevas Tendencias En Educación Física, Deporte y Recreación*, *62*, 304–309.

Hidayat, W., & Linda, L. (2023). The effectiveness of developing culture-based mathematics learning media through visual basic application. *Journal of Honai Math*, *6*(1), 1–16.

Hidayatullah, A., Latif, A., & Herawati, D. (2020). Pendampingan pembelajaran matematika dengan media doratic terhadap siswa penyandang dissabilitas tuna grahita [Assistance in learning mathematics with doratic media for students with mental disabilities. *Humanism: Jurnal Pengabdian Masyarakat*, *1*(1). https://doi.org/10.30651/hm.v1i1.4545

Hong, Y. C., & Choi, I. (2011). Three dimensions of reflective thinking in solving design problems: a conceptual model. *Educational Technology Research and Development*, *59*(5), 687–710. https://doi.org/10.1007/s11423-011-9202-9

Indriyani, I. (2024). *Menemukan & mengembangkan potensi anak berkebutuhan khusus [Discovering & developing the potential of children with special needs*. Bypass.

Jamil, M., Batool Bokhari, T., & Iqbal, J. (2024). Incorporation of critical thinking skills development: A case of mathematics curriculum for grades I-XII. *Journal of Asian Development Studies*, *13*(1), 375–382. https://doi.org/10.62345/jads.2024.13.1.32

Junaedi, Y., Maryam, S., & Lutfi, M. K. (2022). Analisis kemampuan berpikir reflektif siswa SMP pada pembelajaran daring [Analysis of junior high school students' reflective thinking skills in online learning. *Journal of Mathematics Education and Learning*, *2*(1), 49. https://doi.org/10.19184/jomeal.v2i1.30228

Khasawneh, M. A. S. (2024). The efficacy of a programme utilizing digital learning technology in fostering the life skills of students with learning disabilities. *International Journal of Learning, Teaching and Educational Research*, *23*(4), 18–33. https://doi.org/10.26803/ijlter.23.4.2

Kholid, M., Sa'dijah, C., Hidayanto, E., & Permadi, H. (2020). How are students' reflective thinking for problem solving? *Journal for the Education of Gifted Young Scientists*, *8*(3), 1135–1146. https://doi.org/10.17478/jegys.688210

Kholid, M. N., Santosa, Y. T., Toh, T. L., Wijaya, A. P., Sujadi, I., & Hendriana, H. (2024). Defragmenting students' reflective thinking levels for mathematical problem solving: does it work? *Reflective Practice*, *25*(3), 319–351. https://doi.org/10.1080/14623943.2024.2320140

Laurens, T. (2025). Ethnopedagogy of mathematics in the context of a Merdeka curriculum. https://doi.org/10.1063/5.0271519

Le Fanu, G., Kawane, M., & Tesni, S. (2025). Inclusion into what? Education provision for students with disabilities and additional learning needs in Papua New Guinea. *International Journal of Educational Development*, *113*, 103216. https://doi.org/10.1016/j.ijedudev.2025.103216

Lin, C. J., Lee, H. Y., Wang, W. S., Huang, Y. M., & Wu, T. T. (2025). Enhancing reflective thinking in STEM education through experiential learning: The role of generative AI as a learning aid. *Education and Information Technologies*, *30*(5), 6315–6337. https://doi.org/10.1007/s10639-024-13072-5

Mamurov, B., Akramova, G., Qo'ldoshev, R., & Jumaeva, F. (2024). Retracted: Mathematical modelling by using mental arithmetic as a method of teaching. *E3S Web of Conferences*, *538*, 02025. https://doi.org/10.1051/e3sconf/202453802025

Marrus, N., & Hall, L. (2017). Intellectual disability and language disorder. *Child and Adolescent Psychiatric Clinics of North America*, *26*(3), 539–554. https://doi.org/10.1016/j.chc.2017.03.001

Martin, S., C, M., V, M., Rojas, F., Ramirez, C., & Cáceres, A. (2025). Mathematics education for students with intellectual disabilities: Beliefs of chilean special education teachers.

International Journal of Disability, Development and Education, *72*(3), 405–420. https://doi.org/10.1080/1034912X.2024.2427614

Mataheru, W., Laurens, T., & Taihuttu, S. M. (2023). The development of geometry learning using traditional dance context assisted by GeoGebra. *Jurnal Elemen*, *9*(1), 65–83. https://doi.org/10.29408/jel.v9i1.6628

Matitaputty, C., Nusantara, T., Hidayanto, E., & Sukoriyanto, S. (2024). Exploring mathematical knowledge for teaching of in-service teacher in teaching practice: A case of teaching permutation and combination. *AIP Conference Proceedings*, *3049*(1).

McGregor, D. (2007). *Developing thinking; developing learning*. McGraw-Hill Education (UK.

Meyundasari, M. D., Hastuti, I. D., Syaharuddin, S., & Mehmood, S. (2024). The geometric concepts of the Istana Dalam Loka traditional house: An ethnomathematics study. *Jurnal Elemen*, *10*(2), 305–323. https://doi.org/10.29408/jel.v10i2.25208

Muntazhimah, M., Turmudi, T., & Prabawanto, S. (2021). The relation between prior knowledge and students' mathematics reflective thinking ability. *Journal of Physics: Conference Series*, *1731*(1), 012043. https://doi.org/10.1088/1742-6596/1731/1/012043

Muqtafia, K., Rizqiyah, D. M., Diva, S. A., Gabriella, J., Pamungkas, F., & Purwaningrum, J. P. (2024). Komik 3D nusantara berbasis technology pedagogical content knowledge untuk meningkatkan kemampuan aritmatika sosial siswa tunagrahita [3D comics based on pedagogical content knowledge technology to improve the social arithmetic skills of students with intellectual disabilities. *Prismatika: Jurnal Pendidikan dan Riset Matematika*, *6*(2), 498–509.

Mutamam, A. N., Susilawati, W., Maryono, I., & Nuraida, I. (2022). Students' Mathematical Abstractive Reflective Thinking Ability Through Contextual Learning. *Gunung Djati Conference Series*, *12*, 68–72.

Nabila, S. K., Prahardik, S. E., Faturohman, I., & Yuliana, Y. (2024). Peningkatan pemahaman tajwid melalui metode tilawah sebagai upaya membangun lingkungan belajar inklusif di MDTA Desa Kalensari Compreng [Improving understanding of tajweed through the tilawah method as an effort to build an inclusive learning environment at MDTA Kalensari Village Compreng. *Jurnal Peradaban Masyarakat*, *4*(1), 38–47.

Napitupulu, M. B., Malau, J. G., Damanik, C. T., Simanjuntak, S. N., & Widiastuti, M. (2022). Psikologi kepada anak berkebutuhan khusus tunagrahita [Psychology for children with special needs who have a disability. *Jurnal Pendidikan Sosial dan Humaniora*, *1*(4), 325–331.

Ningrum, A. A., & Fauziah, H. N. (2021). Analisis kemampuan berfikir reflektif dalam menyelesaikan permasalahan berbasis isu sosial ilmiah ditinjau dari perbedaan gender [Analysis of reflective thinking skills in solving problems based on scientific social issues in terms of gender differences. *Jurnal Tadris IPA Indonesia*, *1*(2), 87–98. https://doi.org/10.21154/jtii.v1i2.158

Nursupiamin, N., Ramlah, U., & Putri, H. (2025). Characteristics of students in developing reflective thinking in basic algebra. *Al-Jabar : Jurnal Pendidikan Matematika*, *16*(1), 37–54. https://doi.org/10.24042/ajpm.v16i1.25743

Park, Y. (2022). Analysis of teachers' questions in the STEAM class for students with intellectual disabilities. *Journal of Curriculum and Teaching*, *11*(5), 205. https://doi.org/10.5430/jct.v11n5p205

Purba, P. (2024). Ethnomathematics in the form of market snacks in Jargaria Market Dobo. *Sora Journal of Mathematics Education*, *5*(1), 8–18. https://doi.org/10.30598/sora.5.1.8-18

Rahmawati, E., Ferianto, A. N., Damarratih, R., & Sugiman, S. (2021). Potensi alat peraga fun fraction set dalam meningkatkan pemahaman konsep pecahan bagi siswa tunagrahita [The potential of fun fraction set props in improving understanding of fraction concepts for students with disabilities. *PRISMA, Prosiding Seminar Nasional Matematika*, *4*, 160–166.

Ratnasari, Y., & Nurhidayah, D. A. (2020). Analisis berpikir reflektif siswa dalam menyelesaikan masalah matematika [Analysis of students' reflective thinking in solving mathematical problems. *Edupedia*, *4*(2), 161–171.

Ratumanan, T. G., Laurens, T., & Mataheru, W. (2023). Math object identification on material culture on the island of Ambon. *Jurnal Pendidikan Matematika (JUPITEK*, *6*(2), 123–132. https://doi.org/10.30598/jupitekvol6iss2pp123-132

Salido, A., & Dasari, D. (2019). The analysis of students' reflective thinking ability viewed by students' mathematical ability at senior high school. *Journal of Physics: Conference Series*, *1157*, 022121. https://doi.org/10.1088/1742-6596/1157/2/022121

Samad, R. S. S., Hamid, H., & Afandi, A. (2020). Penerapan model problem based learning untuk meningkatkan kemampuan berpikir reflektif siswa pada materi persamaan linear satu variabel [Application of problem-based learning model to improve students' reflective thinking skills on the material of linear equation one variable. *Delta-Pi: Jurnal Matematika Dan Pendidikan Matematika*, *9*(2).

Santosa, Y. T., Antara, S., Sukimin, S., N, & Sutarni, S. (2025). Efektifitas realistic mathematics education berbasis hipothetical larning trajectories terhadap kemampuan berpikir reflektif siswa [Effectiveness of realistic mathematics education based on hypothetical larning trajectories on students' reflective thinking skills. *JIPMat*, *10*(1), 149–161. https://doi.org/10.26877/dwdtj642

Surbeck, E., Han, E. P., & Moyer, J. E. (1991). *Assessing reflective responses*. Education Leadership.

Suryadi, Y., & Armanto, D. (2023). Analysis of the clap method as an recognition strategy mathematics numeration in autism students at special needs school. *Edunesia: Jurnal Ilmiah Pendidikan*, *4*(2), 855–867. https://doi.org/10.51276/edu.v4i2.451

Toraman, Ç., Orakcı, Ş., & Aktan, O. (2020). Analysis of the relationships between mathematics achievement, reflective thinking of problem solving and metacognitive awareness. *International Journal of Progressive Education*, *16*(2), 72–90. https://doi.org/10.29329/ijpe.2020.241.6

Triana, D., & Nadhirah, Y. F. (2024). Kerjasama orang tua dan guru dalam meningkatkan kemampuan anak tunagrahita [Cooperation between parents and teachers in improving the ability of children with disabilities. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *10*(04), 234–244.

Trisnani, N. (2020). Tingkat kemampuan berfikir reflektif siswa sekolah dasar kelas tinggi [The level of reflective thinking ability of high-grade elementary school students. *AR-RIAYAH: Jurnal Pendidikan Dasar*, *4*(2), 131.

Vodičková, B., Mitašíková, P., & Slavíčková, M. (2023). Supportive factors in inclusive mathematics education: mathematics teachers' perspective. *Education Sciences*, *13*(5), 465. https://doi.org/10.3390/educsci13050465

Wati, D. E., & Affrida, E. N. (2024). Pengenalan etnomatematika melalui sempoa pada anak tunagrahita ringan [Introduction of ethnomathematics through abacus for mildly disabled children. *Seminar Nasional Hasil Riset dan Pengabdian*, *6*, 1101–1107.

Yulaini, E., Thalib, D., Novita, D., Lestari, F. P., Anandari, A. A., Mayasari, T., & Suganda, A. D. (2025). *Metodologi pengajaran [Teaching methodology*. Penerbit Widina.

Yunita, M. A., Nurafliyan, S. E., & Rizky, R. (2020). Implementasi metode weight product dalam penentuan klasifikasi kelas tunagrahita [Implementation of the weight product method in determining the classification of the disability class. *7*, 78–82. https://doi.org/10.30656/jsii.v7i2.2408