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Scaffolding to Help Middle School Students' Critical Thinking Skill in Solving Social Arithmetics Problem

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Abstract

Junior high school students in completing social arithmetic material often fail to think critically, so they need help using scaffolding to help critical thinking skill. This qualitative research is a case study of two junior high school students who failed to think critically. Data were obtained through task-based interviews. The tests used in this study were 2 social arithmetic questions that required students' critical thinking skills in solving them. Data analysis used the flow model analysis technique developed by Miles and Huberman (2014) which consisted of data collection, data reduction, data presentation, and drawing conclusions. The researcher uses research diligence to ensure the credibility of the data. The results of this study indicate that Subject 1's critical thinking failure lies in the components of interpretation, and inference. Subject 2 failed to think critically on the components of interpretation, analysis, evaluation, inference, and explanation. The scaffolding given to overcome the failure of critical thinking in subject 1 and subject 2 is the Anghileri's level 2 scaffolding, namely explaining, reviewing, and restructuring.

Keywords: Scaffolding, Critical thinking, Social Arithmetic

Abstrak

Siswa SMP dalam menyelesaikan materi aritmatika sosial sering mengalami kegagalan berpikir kritis, sehingga perlu dibantu menggunakan *scaffolding*. Penelitian kualitatif ini merupakan studi kasus dari dua siswa SMP yang mengalami kegagalan berpikir kritis. Data diperoleh melalui wawancara berbasis tugas. Tes yang digunakan dalam penelitian ini adalah 2 soal aritmatika sosial yang memerlukan kemampuan berpikir kritis siswa dalam menyelesaikannya. Analisis data menggunakan teknik analisis model alir yang dikembangkan oleh Miles and Huberman (2014) yang terdiri dari pengumpulan data, reduksi data, penyajian data, dan penarikan kesimpulan. Peneliti menggunakan ketekunan penelitian untuk menjamin kredibilitas data. Hasil penelitian ini menunjukkan kegagalan berpikir kritis Subjek 1 yang terletak pada komponen interpretasi, dan inferensi. Subjek 2 mengalami kegagalan berpikir kritis pada komponen interpretasi, analisis, evaluasi, inferensi, dan eksplanasi. *Scaffolding* yang diberikan untuk mengatasi kegagalan berpikir kritis subjek 1 dan subjek 2 adalah *scaffolding* Anghileri level 2, yaitu *explaining, reviewing, and restructuring*.

Kata kunci: Scaffolding, Berpikir Kritis, Aritmatika Sosial

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Introduction

The skills to analyze, clarify, and filter information are needed in the 21st century which presents various information across space and time due to rapid technological developments that require critical thinking skills to overcome them (Suparman et al., 2021). Critical thinking is the ability to absorb and filter information from a phenomenon (Facione, 2015). Critical thinking skills are very important to be developed since school time, because these abilities enable students to solve problems in difficult situations and have active and accurate communication skills, so that critical thinking skills have become competency goals in learning in various countries (Sapeni & Said, 2020), one of which uses mathematics. 21st century mathematics learning must be designed in such a way that students can develop critical thinking skills and problem solving, creative and innovative, as well as communication and collaboration (Silber-varod et al., 2019).

Based on this information, students can be said to think critically if they are able to reason, communicate, and apply problems in mathematics to everyday life. One of the materials in mathematics used in everyday life is social arithmetic. Paramitha (2017) states that social arithmetic is an influential mathematical material in the world of commerce. Some of these materials include profit and loss, selling price and purchase price, rebates and discounts, gross, net and tare, as well as annual interest. The material design and exercises in this material are presented in the form of word problems related to everyday life, which require students to understand and interpret the intent of each problem to decide which methods can be used to solve the problem. This is expected to help improve students' critical thinking skills.

However, several studies have shown low critical thinking skills in Indonesia, such as research by Basri et al. (2019), which shows that junior high school students' critical thinking skills in solving math problems are in the low category. Kempirmase et al. (2019) in class XI SMA. Students showed that students' critical thinking skills in solving HOTS questions were still very low. Hendryawan et al (2017) shows that students with low critical thinking skills are only able to master two of the six indicators of critical thinking skills in solving numeracy problems. So this needs to get serious attention and treatment.

In overcoming this can be applied scaffolding in learning to increase student motivation (Kusmaryono et al., 2020; Prabawanto, 2018). Scaffolding derived from the word scaffold which means ladders for construction workers to step on to help with construction (Zheng et al., 2019), so scaffolding in learning can be interpreted as assistance/techniques that are carried out in a structured manner to support learning (Maksić & Jošić, 2021).Arifin et al. (2020) said that scaffolding is assistance, both orally and in writing, given by the teacher to students who cannot complete their assignments independently, so that it is a gift scaffolding can be done outside of learning to help solve math problems (Agustina & Setianingsih, 2017). Therefore, this study uses scaffolding in helping students' critical thinking skills solve math problems that are carried out outside of learning activities.

Several previous studies related to scaffolding among other things, a meta-analysis about scaffolding based Treffinger to improve students' critical thinking skills (Like Triyanti et al., 2021), qualitative research on the effect of scaffolding on social arithmetic material (Susilowati & Ratu, 2018), as well as research on scaffolding in solving math problems (Arifin et al., 2020). From some of these studies it can be seen that scaffolding has an important role in the process of solving mathematical problems and is effective in helping to improve students' critical thinking skills.

However, it has not discussed the relationship of scaffolding, critical thinking skills, and social arithmetic material. Therefore, more in-depth research on this problem needs to be done. So the purpose of this study is to provide scaffolding to help students who experience failure in critical thinking processes in social arithmetic material.

After identifying several studies on scaffolding and critical thinking, as well as critical thinking in mathematics education, it is felt necessary to describe the theoretical framework that this research refers to. An explanation of this theoretical framework forms the basis for building new knowledge, especially those that will be discussed through this research.

a. Critical Thinking in Mathematics Education

Critical thinking is a process of using thinking skills effectively to help someone make something, evaluate, and apply decisions according to what is believed or done (Siswono, 2016).Some experts have different opinions about the components for measuring critical thinking skills, one of which according to Facione (2015) there are six core components in critical thinking skills, including interpretation, analysis, evaluation, conclusions, explanations, and self-regulation.In this study, researchers developed critical thinking questions based on the sub-components proposed by Facione (2015) because they are cognitive skills that are the core of critical thinking (Facione, 2015), and are

considered more appropriate for measuring students' critical thinking skills in mathematics (Basri et al., 2019).

In the 2013 curriculum, mathematical ability has an important role in shaping problem solving abilities. Learning mathematics is designed to hone problem-solving skills that require problem identification, choosing a solution strategy, finding relationships between material, proof, analyzing processes and results, and drawing general conclusions. These abilities are closely related to critical thinking skills, so learning mathematics is an alternative in an effort to improve students' critical thinking skills. Therefore, improving the quality of learning mathematics must be done not only because of the importance of mathematics in science, but to improve students' mathematical abilities which are indicators of critical thinking skills.

b. Scaffolding and Critical Thinking

Critical thinking is one of the important skills in the 21st century. This is due to the rapid development of information and communication technology which has increased the amount of information being disseminated. Everyone must have the ability to think critically to analyze and compare information to make arguments and conclusions in everyday life (Atabaki et al., 2015). Critical thinking is the ability to think to make decisions, interpret, or solve problems. In short, the ability to think critically is the ability to absorb and filter information to draw conclusions or decisions.

In improving critical thinking skills, Dale (2020) states that scaffolding can be a way to think when learning is carried out which helps improve critical thinking skills. Belland (2017) explained that scaffolding is an instruction given by the teacher to help students who need additional support to improve their ability and independent thinking. Anghileri (2006) Anghileri (2006) divides scaffolding into three levels, namely: (1) environmental provisions, (2) explaining, reviewing, and restructuring, (3) developing conceptual thinking. By using scaffolding as an aid in learning, students will receive more detailed directions and instructions from the teacher, so that they can motivate students to achieve learning goals (Wartono et al., 2019).

Method

This qualitative research uses case studies, meaning that this research departs from a particular case, and can be transferred or applied to social situations (other places) if these other social situations have similarities with the social situations studied (Siswono, 2010). This study describes the provision of scaffolding to help students who experience failure in critical thinking processes in social arithmetic material.

a. Research subject

The sampling technique used is by using non probability sampling with purposive method sampling, by choosing a sample based on the subjectivity of the researcher from the person or unit according to the characteristics and objectives of the research (Rukminingsih et al., 2020). The selected subjects consisted of one male junior high school student with moderate mathematical ability and one female junior high school student with low mathematical ability.

b. Data collection

Data was collected using task-based interviews. Data collection was carried out by giving tests to find out the extent of students' ability to solve questions on social arithmetic material, then conducting interviews with students about the results of their work to provide reinforcement through scaffolding. Researchers use observation persistence to ensure the validity of the data.

c. Data analysis

Data analysis was carried out using the flow model analysis technique developed by Miles and Huberman (2014) which consisted of data collection, data reduction, data presentation, and drawing conclusions. Data collection was carried out by task-based interviews. From the results of the interview, it was obtained the categories of critical thinking failure experienced by the subject as well as the appropriate scaffolding given to help with these failures, this stage included data reduction. Then the data analysis results are presented by attaching the results of tests and interviews with research subjects. And finally conclusions are made based on the research objectives made.

d. Research Instruments

The test in this study uses 2 questions on social arithmetic material which require a critical thinking process in solving them.

Instrumen Soal

1. Menjelang lebaran, beberapa toko pakaian memberikan diskon (potongan harga)

   Tabel berikut menunjukkan daftar harga normal (sebelum diskon) dan diskon yang diberikan pada beberapa toko.

Nama Toko	Harga Satuan		Diskon	
	Baju	Celana	Baju	Celana
Sae Fashion	Rp100.000,00	Rp100.000,00	20%	20%
Rizki Store	Rp90.000,00	Rp110.000,00	15%	25%
Cantik Busana	Rp105.000,00	Rp95.000,00	25%	15%

   Indah memiliki uang Rp300.000,00 dan ingin membeli beberapa baju dan celana untuk lebaran (ia ingin membeli baju dan celana yang beragam). Agar sisa uang dan produk yang didapat paling banyak, di toko mana saja ia harus membeli? Jika uangnya sisa, maka berapakah sisa uangnya?

2. Perusahaan kendaraan *Safety* memproduksi 3 jenis motor dengan kode A, B, dan C. Berikut ini disajikan tabel biaya produksi dan harga penjualan motor tersebut

Kode Produksi	Biaya Produksi (rupiah)	Harga Jual (rupiah)
A	20.800.000	30.200.000
B	25.200.000	35.000.000
C	28.900.000	40.000.000

   Jika ketiga motor tersebut sama-sama laku di pasaran, kalian ingin menjual motor yang mana? Jelaskan alasannya

Figure 1. Question Instrument

Result and Discussion

Failure of Interpretation on Subject 1

Subject 1 was indicated to have experienced a failure to think critically, namely the subject misunderstood the intent of the question. From the results of the interview, the subject considered that the question asked the character in the problem to buy shirts and pants only at one shop. The critical thinking failure experienced by subject 1 is a failure in the interpretation component.

The scaffolding provided to help the failure of critical thinking is in the form of reviewing. This form of scaffolding is carried out by giving encouragement questions to subject 1 to understand each word and look back at the meaning of the question. After being given scaffolding, subject 1 understands that the question does not require the character in the question to buy clothes and pants at the same store

Table 1. Scaffolding to help failure to think critically components of interpretation

R: "what information did you get in the question?"
S1: "about the unit price of shirts and pants at Sae Fashion, Rizky Store, and Cantik Busana stores"
R: "is there any other information obtained?"
S1: "discounts given by each shop for shirts and pants sold"
T: "okay, is there anything else?"

S1: “Indah has Rp. 300,000.00”
R: "then, is there anything else?"
S1: "Indah wants to buy a variety of shirts and pants, with the products you get and the most money back"
R: “Okay, that means Indah buys products at different stores, is it permissible?”
S1: "yes it is"

Inference Failure on Subject 1

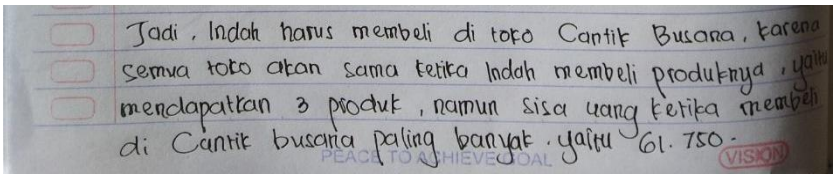

Figure 2. Subject 1's critical thinking failure in the inference component for question no.1

In Figure 2, it can be seen the conclusions obtained by subject 1 in determining the most remaining money after buying shirts and pants. However, due to a lack of understanding of the meaning of the question, when being interviewed regarding other possible answers that could provide more remaining money, subject 1 was confused and thought that the answer was correct, that there was no combination of buying other shirts and pants to produce more remaining money. Errors in determining the elements needed to determine this conclusion indicate that subject 1 experienced a critical thinking failure in the inference component.

The scaffolding provided is in the form of explaining and reviewing. The form of scaffolding explaining is given by reminding the purpose of the questions, then related to the answers that have been obtained by subject 1. The form of scaffolding reviewing is done by giving directions so that the subject tries to make a combination of buying clothes and pants at different stores. After being given scaffolding, subject 1 can find more remaining money by a combination of buying 1 shirt at a risky store, 1 shirt at a fashion beauty shop, and 1 pair of pants at a sae fashion shop, with the remaining money earned IDR 64,750.00

Table 2. Scaffolding to help critical thinking failure inference components

R: "In your opinion, is there an alternative answer that generates more money back, other than Indah buying 2 shirts and 1 pair of pants at a Cantik fashion shop?"
S1: "I don't think there is, sis, because after I counted the most money left in the fashion beauty shop"
R: "Let's look at it again, because Indah wants to buy a variety of shirts and pants, which means Indah wants to buy clothes and pants that are not the same. The information in the question must be understood that the price listed is the price of the type of shirt and pants in each store. For example, at Sae Fashion, the price for the clothes provided is IDR 100,000.00, which means that this price is for one particular dress. It is impossible for the price of the clothes to be the same for different types. Is the information understandable?”
S1: "Understand sis"
R: "Well, if you answer, Indah will buy 2 clothes at a fashion beauty shop, that means Indah will get 2 clothes, are the clothes the same or not?"
S1: "Same sister"
R: "It means that the answer that Indah bought 2 clothes in a beautiful dress is not quite right. Try to observe the results of your calculations for the price to be paid at each shop. Which shop has the cheapest clothes?”

S1: “rizki store, then beautiful clothes, and the most expensive is sae fashion”
R: "And for the price of the pants, which shop is the cheapest?"
S1: “sae fashion, then beautiful clothes, and the most expensive one at rizki store”
R: "Well, how another combination so that the clothes and pants that Indah bought varied?"
S1: "1 shirt at a risky store, 1 shirt at a fashion beauty shop, and 1 pair of pants at a sae fashion shop, with change received of IDR 64,750.00"

Failure of Interpretation on Subject 2

Subject 2 is indicated to have experienced a failure to think critically, namely the subject misunderstood the intent of the question. From the results of the interview, the subject considered that the question asked the character in the problem to buy shirts and pants only at one shop. The critical thinking failure experienced by subject 2 is a failure in the interpretation component.

The scaffolding given to help the failure of critical thinking is in the form of explaining and reviewing. The form of scaffolding explaining is done by explaining the meaning of each word that makes up the sentence in the question. Then scaffolding is given in the form of reviewing by giving encouragement questions to subject 2 to look for the purpose of the question again. After being given scaffolding, subject 2 understood the problem that the question did not require the character in the problem to buy shirts and pants at the same store.

Table 3. Scaffolding to help failure to think critically components of interpretation

R: "Do you understand the point of question no.1?"
S2: "still confused sis"
R: "What do you think this question asks for?"
S2: "Indah buys a variety of shirts and pants sis"
R: "Yeah, that's right, that means if Indah buys 2 clothes, then the 2 clothes can't be the same, right?"
S2: “yah sis”
R: "Then if Indah buys clothes at one shop, will the clothes you get be different?"
S2: “no sis”
R: “Yes, because here the information provided is the price and discount for just one shirt and one pair of pants at each store, meaning that if Indah buys more than one shirt or pair of pants at the same store, Indah will get the same shirt or pair of pants. Has Indah's wish for a variety of shirts and trousers been fulfilled?”
S2: “no sis”
R: "so how?"
S2: “Indah has to buy at different stores to get different products”

Failure Analysis on Subject 2

Subject 2 is also indicated to have experienced critical thinking failure in the analysis component. From the interview results, subject 2 admitted that he was still confused in determining the price of goods that were given a discount. Subject 2 assumes that to find the price of goods, all that has to be done is the initial price minus the discount percentage.

The scaffolding provided is in the form of explaining and reviewing. The form of explaining is given by giving directions regarding the meaning and concept of discounts. Then given scaffolding reviewing by giving encouragement questions about the price of an item after getting a discount. After being given scaffolding, subject 2 knows how to determine the price that must be paid after receiving a discount, by way of the initial price minus the discounted price.

Table 4. Scaffolding to help failure to think critically component analysis

R: “Which sentence is confusing?”
S2: "Confused about the price and discount sis, if the price is that much you can get a discount, then what price do you pay?"
R: "Then how did you go about finding a solution to this problem?"
S2: "Look at the initial price first, then look at the discount, sis."
R: "Yes, that's right, then how do you find the price to pay?"
S2: "If I count the beautiful clothes, the price is IDR 105,000.00 then the discount is 25%, then it's deducted"
R: "If IDR 105,000.00 immediately minus 25, how much will you get?"
S2: “IDR 80.000,00 sis”
R: "Well, earlier, the price that had to be paid was IDR 78,750.00, right?"
S2: “yah sis”
R: "then how?"
S2: "still confused sis"
R: "what is the meaning of discount?"
S2: “price reduction”
R: "So if the initial price is IDR 105,000.00 then you get a 25% discount from the initial price or after calculating the discount is IDR 26,250.00, which means how much do you have to pay?"
S2: “IDR 78.750,00 sis”
R: "means you already understand how to find the price to pay?"
S2: “initial price minus discount”

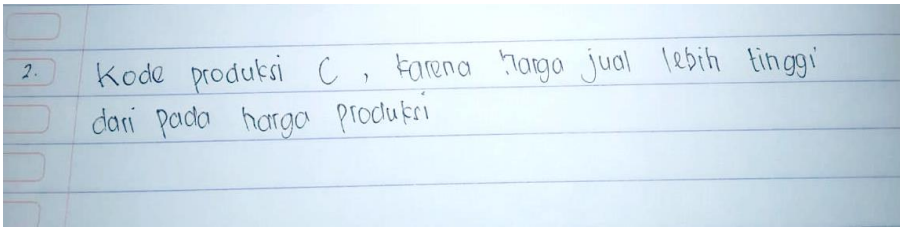

Figure 3. Subject 2's answer to question no.2

From Figure 3 it can be seen that the subject's answers indicate failure to think critically in the analysis component. Subject 2 stated in his answer that he chose production code C because the selling price was higher than the production price. After being interviewed and asked, subject 2 confused because the information in the question turned out that production codes A and B also had a higher selling price than the production price.

The scaffolding given to help subject 2 is in the form of reviewing. The reviewing form is given by giving encouragement questions about the concept of profit, then asking subject 2 to look for the advantages of each production code. After getting scaffolding subject 2 was able to know that the stated selling price was higher than the production price was not enough to make a conclusion.

Table 5. Scaffolding to help failure to think critically component analysis

R: "Your answer earlier stated that you chose production code C because the selling price was higher than the production price, so what if the selling price was higher?"
S2: "because of getting more profit"
R: "Then the words should be changed, because even in production code A and B the selling price is higher than the production price or not?"

S2: "yah sis"
T: "Well, the words should be replaced using profit only"

Evaluation Failure on Subject 2

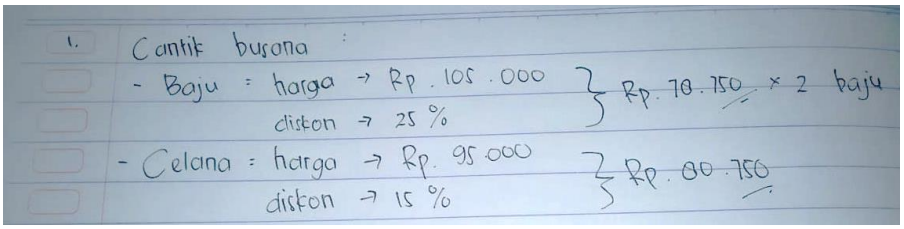

Figure 4. Failure to think critically subject 2 in the evaluation component for question no.1

Seen in figure 4, the results of subject 2's answers to determine the most remaining money after getting a discount are simply by calculating the price of clothes and pants after getting a discount at a Cantik fashion shop. After being interviewed, subject 2 admitted that he had calculated the price of clothes and pants that had to be paid at the Sae Fashion store and the Rizki store. However, when asked if there was a possibility that the price after being discounted at the Sae Fashion and Rizki stores would be cheaper than at the Cantik Fashion store, subject 2 seemed confused and admitted that she did not understand how to calculate the discount. This indicated that subject 2 experienced a failure to think critically in the evaluation component.

The form of scaffolding provided is in the form of explaining and reviewing. The form of explaining is done by explaining how to find out the discounted price from the percentage discount given. The reviewing form is given by giving a simpler type of question regarding determining the price after a discount, then subject 2 is given encouragement questions to apply the concept to the discount problem contained in the problem. After getting scaffolding, subject 2 knows how to find the price to be paid after getting a discount.

Table 6. Scaffolding to help failure to think critically evaluation component

R: "From your answer, you are only calculating the price of clothes and pants that must be paid at a fashion store. Have you calculated the price for the clothes and trousers at the Sae Fashion store and the Rizki store?"
S2: "not yet sis"
R: "Then how do you determine that the price of the shirt and pants in the beauty of fashion is the cheapest price? Who knows, if you calculate the prices at Sae Fashion and the Rizki store, it turns out that you will get a cheaper one."
S2: "I counted the others, but I didn't write them down, only do it in mind"
R: "how to do it?"
S2: "If I count the beautiful clothes, the price is IDR 105,000.00 then the discount is 25%, then it's deducted"
R: "If IDR 105,000.00 immediately minus 25, how much will you get?"
S2: "IDR 80.000,00 sis"
R: "Well, earlier, the price that had to be paid was IDR 78,750.00, right?"
S2: "yah sis"
R: "then how?"
S2: "still confused sis"
R: "what is the meaning of discount?"
S2: "price reduction"
R: "Let me give a simpler example, if you buy an item for IDR 10,000.00 and then get a 25% discount, how much discount will you get?"

S2: “IDR 2.500,00 sis”
R: "Well, if you give a discount of IDR 10,000.00 for IDR 2,500.00, what price do you have to pay the seller?"
S2: “IDR 7.500,00 sis”
R: "That's right, so if the initial price of the shirt is IDR 105,000.00 then you get a 25% discount from the initial price or after calculating the discount is IDR 26,250.00, which means how much do you have to pay?"
S2: “IDR 78.750,00 sis”

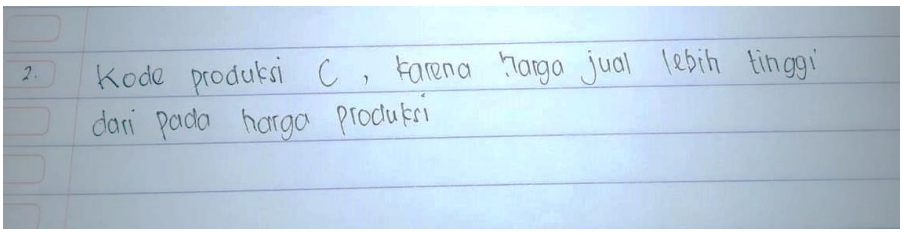

Figure 5. Subject 2's answer to question no.2

In addition, from Figure 5 it can also be seen that subject 2 experienced a failure to think critically in the evaluation component, namely subject 2 did not calculate the benefits of each production code. When interviewed, subject 2 admitted that he did not calculate the profit to solve problem number 2.

The scaffolding provided is in the form of reviewing. Reviewing is done by giving encouragement questions regarding the concept of profit, then asking subject 2 to look for the advantages of each production code. After obtaining scaffolding, subject 2 was able to find out the advantages of each production code.

Inference Failure on Subject 2

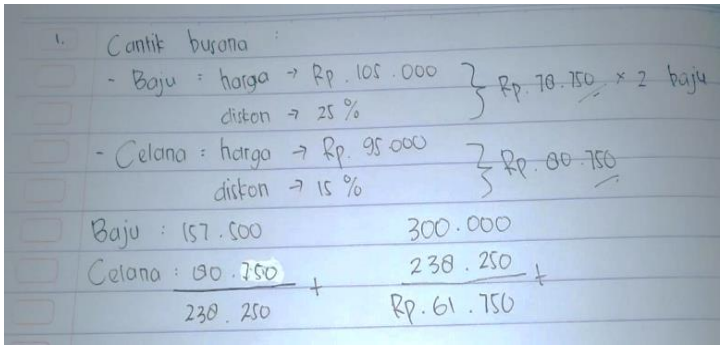

Figure 6. Subject 2's failure to think critically on the inference component for question no.1

It can be seen in figure 6 that subject 2 did not write down the conclusion of the solution to problem number 1, but only counted the remaining money that was obtained when shopping for 2 shirts and 1 pair of pants at a Cantik fashion store. This is the result of the previous failure to think critically, namely subject 2 did not understand the purpose of the question and was confused about how to determine the price to be paid after being discounted, so subject 2 experienced a failure to think critically inference.

The scaffolding provided is in the form of reviewing by asking encouragement questions about how much the price is after discounting the clothes and pants for each store, then looking for combinations of buying clothes and pants to get the most change. After being given scaffolding,

subject 2 can get the most change with a combination of buying 1 shirt at a risky store, 1 shirt at a fashion beauty shop, and 1 pair of pants at a sae fashion shop, with a change of IDR 64,750.00

Table 7. Scaffolding to help critical thinking failure inference component

R: "In your answer sheet you answered, Indah will buy 2 clothes at a fashion store, which means Indah can get 2 clothes, the clothes are the same or not?"
S1: "Same sister"
R: "It means that the answer that Indah bought 2 clothes in a beautiful dress is not quite right. Try to observe the calculation results for the price to be paid at each store. Which shop has the cheapest clothes?"
S1: "rizki store, then beautiful clothes, and the most expensive is sae fashion"
R: "As for the price of the pants, which shop is the cheapest?"
S1: "sae fashion, then beautiful clothes, and the most expensive one at rizki store"
R: "Well, that means another combination so that the clothes and pants that Indah bought varied how?"
S1: "1 shirt at a risky store, 1 shirt at a fashion beauty shop, and 1 pair of pants at a sae fashion shop, with change received of IDR 64,750.00"

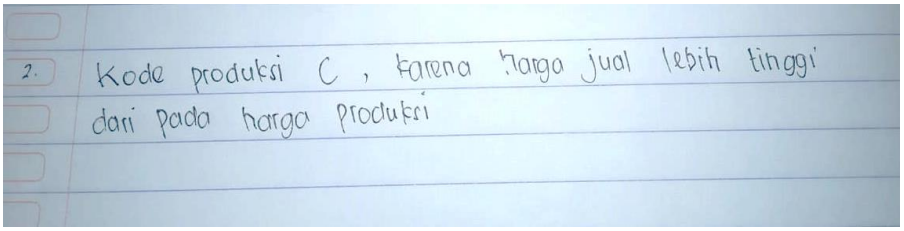

Figure 7. Subject 2's answer to question no.2

Subject 2 also indicated a failure to think critically on the inference component, namely subject 2 was wrong in determining the information needed to make a conclusion by assuming that the selling price is higher than the production price. When interviewed, subject 2 thought that production code C was worth choosing because the selling price was the highest among the three production codes.

Scaffolding is given in the form of explaining by giving directions for making conclusions from the results of previous calculations regarding the benefits obtained from each production code. After getting scaffolding, subject 2 was able to draw conclusions using the concept of profit.

Explanation Failure in Subject 2

In addition, in question number 1, subject 2 also indicated a failure to think critically in the explanation component. From the interview results, subject 2 looked confused when asked to explain the purpose of the questions, the information provided in the questions, and what steps had to be taken.

The scaffolding provided is in the form of reviewing by giving encouragement questions about things that are known in the questions and answers given by subject 2. After being given scaffolding subject 2 becomes easy and confident in conveying explanations of the answers.

Table 8. Scaffolding to help failure to think critically with explanation components

R: "Do you understand the point of question no.1?"
S2: "still confused sis"
R: "What do you think this question asks for?"
S2: "It's nice to buy a variety of shirts and pants sis"
R: "What information do you get from the questions?"

S2: "I'm confused sis"
R: “Which sentence is confusing?”
S2: "Confused about the price and discount sis, if the price is that much you can get a discount, then what price do you pay?"
R: "It means you know what is known in the question is the initial price and the amount of the discount given"
S2: “yah sis”

Based on the results shown, it shows how the scafolding process plays a major role in the process of increasing students' critical thinking. There are three levels of scaffolding, starting from environmental provisions; explaining, reviewing, and restructuring, and developing conceptual thinking appear to be raised. The form of scaffolding given is adjusted to the types of mistakes students experience, including explaining, namely conveying the concepts learned, reviewing, namely refocusing student attention, and restructuring, namely reconstruct understanding (Hamidah et al., 2019). This result is in line with Dale (2020) research that states scaffolding can be a way to think when learning is carried out which helps improve critical thinking skills. Belland (2017) also explained that scaffolding is an instruction given by the teacher to help students who need additional support to improve their ability and independent thinking.

In addition to providing scaffolding, several things need to be considered in improving students' critical thinking skills. Providing HOTs-level problems contributes to improving students' critical thinking skills (Asfar et al., 2021). Selection of a suitable learning model also needs to be considered to improve students' critical thinking skills, such as problem-based learning, discovery, and problem posing models (Martaida et al., 2017; Sapta et al., 2019; Khotimah et al., 2021). This could be a consideration in future research to improve students' critical thinking skills.

Conclusion

Based on the results of the research and discussion, it can be concluded that there is a failure for some components of critical thinking in junior high school students. Failures that occur in the interpretation component are failures to understand the questions given. Failures that occur in component analysis are failures to determine the components needed to solve the problem. Failures that occur in the evaluation component are failures to perform calculations that help find solutions to the problems given. Failures that occur in the inference component are failures in determining the components needed to draw conclusions from the solution to the problem in the problem. Failures that occur in the explanation component are failures to explain what steps must be taken to solve the problem based on the information provided in the problem.

To assist the subject in overcoming critical thinking failure, assistance is provided in the form of scaffolding. The scaffolding provided to help the failure of critical thinking in the interpretation component is explaining and reviewing. The scaffolding provided to help the failure of critical thinking in the analysis component is explaining and reviewing. The scaffolding provided to help the failure of critical thinking in the evaluation component is explaining and reviewing. The scaffolding provided to help the failure of critical thinking on the inference component is explaining and reviewing. The scaffolding provided to help critical thinking failure in the explanation component is reviewing.

From the results of this study it can be seen that the provision of scaffolding can help students who experience failure to think critically. This can be implemented in classroom learning, to deal with students who experience failure to think critically when solving math problems.

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