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Choosing the Right Store: How Open-Ended Tasks Help Middle School Students Learn Financial Literacy

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Abstract

This study explores how junior high school students understand different types of discounts through percent multiplication. We used the qualitative study and analyzed the in-depth answers of three of the 32 participants as research subjects. The end-of-year discount selection activity provides a daily context to build knowledge about needs and wants. Students engage with open-ended tasks requiring mathematical methods to make financial decisions. These activities help students recognize discounts in everyday life, develop problem-solving strategies, and improve mathematical skills. The article highlights how students analyze various store discounts and guide readers in distinguishing between needs and wants. Early exposure to financial math fosters responsible consumer behavior. The study emphasizes the importance of applying comprehensive information to solve financial problems by connecting mathematics to real-life scenarios. The results indicate that the implementation of an open-ended task has the potential to facilitate understanding of financial decision-making and mathematical skills.

Keywords: Discount; Financial Literacy; Middle School Student; Open-ended task; Percentage

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INTRODUCTION

Organization for Economic Co-operation and Development (OECD) has suggested several subjects that can provide financial literacy content, one of which is mathematics (OECD, 2019). By integrating financial literacy into the mathematics curriculum, students not only improve their mathematical abilities but also acquire essential skills to manage their finances effectively in the future. Utilizing financial contexts in mathematics education serves not only provide real-world relevance to problems but also to receive financial knowledge and cultivate positive financial attitude (Lusardi, 2019; Lusardi & Mitchell, 2014). Furthermore, integrating financial literacy into mathematics learning involves employing financial contexts, fostering an understanding financial terminology, and developing critical decision-making skills (Sagita et al., 2023a).

Indonesia's 2018 financial literacy measurement results placed the country at level 1, categorized as “significantly below the OECD average” (OECD, 2019). This indicates that Indonesian students primarily demonstrate proficiency in basic arithmetic operations— addition, subtraction, and multiplication—in financial contexts but struggle in applying their knowledge to real-life contexts involving decision-making (OECD, 2019). Consistent with this, research highlights challenges students face when applying financial knowledge in decision-making contexts (Lusardi & Mitchell, 2014; Savard, 2022a). Financial literacy, however, plays a crucial role in improving individual decision-

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making and overall well-being, contributing to financial stability and development (Lusardi & Mitchell, 2023). At higher levels of proficiency in financial literacy, students not only demonstrate the ability to use mathematical tools but also exhibit the skills to select the most appropriate tools for specific financial tasks (OECD, 2024).

Prayitno (2023) found that students often make errors in interpreting problems, applying the concept of discounts, performing operations, and providing final answers. Specifically, errors in interpreting problems are frequently caused by students misunderstanding the meaning of the discount and making mistakes in solving related problems (Prayitno, 2023; Nusantara & Susanto, 2016). This research shows that solving financial problems requires not only students' ability to complete mathematical procedures but also students' knowledge of financial terms with the right task design and context. Therefore, it is essential to develop tasks that not only assess students' knowledge but also encourage them to critically and contextually address financial situations.

Open-ended tasks are highly suitable for this purpose, as they facilitate exploration and problem-solving in financial contexts that are novel, unconventional, and relevant to real-life situations (Sawatzki et al., 2020). These tasks provide intellectual challenges that encourage students to develop flexible thinking, enhance reasoning skills, and improve their decision-making abilities by employing various strategies (Nieminen et al., 2022). Previous studies have demonstrated that such tasks can be used to assess students' understanding of financial literacy. For example, Moreira Costa et al. (2021) evaluated the financial literacy of 100 adults by examining their understanding of concepts such as inflation, simple and compound interest, diversification, risk/reward balance, and the characteristics of banking products like checking accounts, deposits, credit card fees, and loan interest rates. Furthermore, the design of open-ended tasks enables students to engage with problems that do not have a single correct answer, encouraging them to explore multiple solutions and approaches based on their own ideas and understanding (Kosyvas, 2016). As such, open-ended tasks are not only relevant but also effective in fostering holistic, context-based financial literacy.

In this case, “context” or “contextual problems” do not always interpret as something 'real' or concrete, but may also encompass situations that students can imagine or understand (Gravemeijer & van Erde, 2009; van den Heuvel-Panhuizen & Drijvers, 2020). Financial literacy content in mathematics learning can involve problems that are imaginative, authentic, and practical (Sawatzki & Goos, 2018; Sawatzki & Sullivan, 2018). Sawatzki (2017) analyzed the ability of students in grades 5 and 6 to solve financial problems through three contextual tasks: "Catching the Bus," "Laser Tag," and "Buying Bread," which focus on problem-solving. Sawatzki (2017) found that evaluating the reliability of these problem contexts is challenging, as the suitability of tasks is influenced by students' family backgrounds, characteristics, and interests, which can complicate the design of contextual learning tasks. In addition, Cavalcante and Savard (2021) presented a project-based task for grade 11 students (ages 16–17) using contexts such as insurance, car insurance policies, real estate, real-estate price evolution, borrowing and debt, credit cards, and credit instruments, including minimum payments. This

project-based task was designed based on the financial numeracy task framework, which includes the contextual, conceptual, and systemic dimensions. Cavalcante and Savard (2021) found that identifying opportunities to teach financial numeracy is difficult, and thus, teachers may require support to recognize and implement the three components of the financial numeracy task framework. Both studies emphasize the importance of using real-world contexts to teach financial literacy. Sawatzki (2017) employs problem-solving tasks related to everyday scenarios like public transportation and shopping, while Cavalcante and Savard (2021) incorporate a variety of financial contexts, such as insurance and real estate. Moreover, a notable distinction between the two studies lies in their approaches. Sawatzki (2017) does not explicitly employ a specific financial numeracy task framework, but instead focuses on the challenges of evaluating contextual relevance for younger students. In contrast, Cavalcante and Savard (2021) use a structured approach by designing tasks based on a well-defined financial numeracy framework, encompassing contextual, conceptual, and systemic dimensions, providing a comprehensive method for financial education.

Our goal was to investigate students' mathematical procedures to find the best financial literacy decisions concerning needs and wants. This article analyzes qualitative data gathered from classroom discussions, focusing on three students' responses with differing attitudes toward selecting shoe stores offering various discounts. The research question posed is, "How do open-ended questions in financial literacy contexts influence students' attitudes toward financial decisions when choosing between shoe stores offering different discounts?". The analysis is subsequently employed to indicate that the suggested open-ended questions enhance students' attitudes toward financial problem-solving. This research is urgent due to its potential to improve financial decision-making and mathematical skills. Many students struggle with understanding discounts, which adversely impacts their ability to manage personal finances and make informed consumer choices. Integrating financial literacy into mathematics education, not only reinforce essential arithmetic skills, such as percentage calculations but also equips students with practical knowledge applicable in real-life situations. This research addresses gaps in financial literacy, particularly in countries with low literacy levels, and promotes responsible consumer behavior. Ultimately, it aims to help students become more financially informed and better equipped to navigate everyday financial decisions.

METHODS

Research Procedure

This qualitative research focused on an in-depth analysis of three students' responses, selected from 32 subjects. This selection was based on the principle of purposive sampling, a technique that chooses samples for their ability to provide relevant and insightful information aligned with research objectives (Etikan, 2016). This approach ensured the inclusion of responses that were particularly illustrative of

the research objectives (Miles & Huberman, 2014). The data analysis process involves data reduction, data representation, and conclusion drawing (Figure 1).

Figure 1. Data analyzing procedure

The data reduction process was carried out by selecting certain parts of the students' responses based on the differences in their answer choices and mathematical procedures. At this stage, relevant data was selected to focus the analysis on the most important information and support the research objectives. Data were gathered from students' written responses and interviews, selecting various sections that highlighted their approaches to solving the open-ended task. This data presentation allowed the researcher to more easily analyze and interpret the answers and interactions during the research process. The selected data were presented as transcripts of conversations between researchers and participants, as well as images of students' written responses. This format facilitated a clear analysis of the answers and interactions observed during the research process. Based on the students' responses, the researcher then drew **conclusions**. In this final stage, researchers conducted an in-depth interpretation of the collated data. Conclusions were drawn based on the students' responses, providing insights into their understanding and attitudes towards the issues discussed in the study.

This study prioritizes understanding students thought processes regarding financial literacy and decision-making strategies. To achieve this, an in-depth analysis of some students' responses were opted for, rather than a mere summarization of all subjects' answers. By analyzing only three students' responses, the researchers can identify the diverse range of understanding and application of financial literacy concepts that emerged during class discussions and provide more specific insights into how they addressed discounting-related issues. This approach is in line with the phenomenological methodology, which focuses more on individual experiences and their meanings in a particular context, as described by Creswell (2013).

Open-Ended Task in Financial Problem

The problem in Figure 2 refers to the definition of financial literacy as outlined by the OECD as follows.

> *...knowledge and understanding of financial concepts and risks, as well as the skills and attitudes to apply this knowledge and understanding in order to make effective decisions in various financial contexts, to improve the financial well-being of individuals and communities, and to enable participation in economic life* (OECD, 2019).

The tasks were designed to include problems relevant to students' daily experiences, ensuring relatability and comprehensibility. This task not only supports their understanding but also provides a foundation for tackling novel challenges, such as evaluating layered discounts, comparing different promotional strategies, and applying mathematical reasoning in real-life contexts. Moreover, students can integrate school assignments into their daily routines to reinforce learning (Sawatzki, 2017). To ensure alignment with students' financial realities, the teacher and researcher collaborated to modify the problem context resulting in open-ended tasks, such as the financial problem embedded in the ' End-Year Promo' scenario, as shown in Figure 2. A double discount as presented on tasks is a type of discount that students may rarely encounter. Double discount are offered in ascending sequences (e.g., 10% off, followed by an additional 40% off) or descending sequences (e.g., 30% off, followed by an additional 20% off) (Gong et al., 2019). This context challenges students to explore discounts scenarios under the theme "End Year Promo" (Figure 2).

Figure 2. An open-ended task in the financial problem "End Year Promo" context

The open-ended task was specifically designed to accommodate multiple solutions or perspectives from students, rather than limiting students to a single correct answer. Each student has forty minutes to analyze and solve the problem. The task was designed according to the content, context, and process domains outlined in the financial literacy framework developed by the OECD and adapted for use in mathematics classes (Sagita et al., 2023a). This study's scope within the financial literacy framework focuses on specific aspects of the content, context, and process domains. The process descriptor is defined as 'identify discount offers and rebates'. The goal is to assess students' ability to

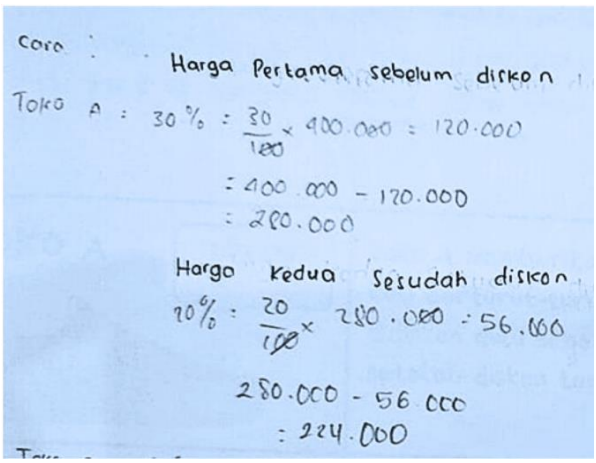
understand various types of discounts (e.g., double discounts, direct discounts) and price reductions, apply basic arithmetic skills (percentages and fractions) to solve financial problems, and use mathematical procedures to justify their choice of store.

RESULTS AND DISCUSSION

As mentioned in the method section, the tasks were analyzed qualitatively through three stages. The first stage involved data reduction by selecting student responses based on the differences in their answer choices and mathematical procedures. The analysis of the student responses showed that while they possessed knowledge of various types of discounts and price reductions and were able to calculate discounts accurately, their understanding of the implications of these discounts on final purchasing decisions varied. The analysis of responses from the three selected students is presented below, referred to as Student Response 1 (SR-1), Student Response 2 (SR-2), and Student Response 3 (SR-3).

Student Response -1 (SR-1)

SR-1 demonstrated his knowledge of the double discount offered by Store A. This type of discount refers to the application of two or more discounts sequentially rather than the direct summation of the discount percentages. This understanding was evident in SR-1's accurate calculation of the discounted price, as illustrated in Figure 3.



English version:

Calculation
Store A
Price after the first discount

$$30\%: = \frac{30}{100} \times 400.000 = 120.000$$
$$= 400.000 - 120.000$$
$$= 280.000$$

Price after applying the second discount

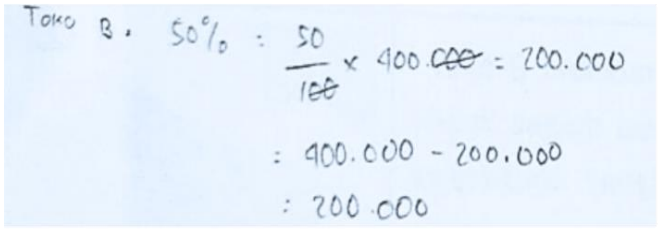
$$20\%: = \frac{20}{100} \times 280.000 = 56.000$$
$$= 280.000 - 56.000$$
$$= 224.000$$

Figure 3. SR-1's understanding of cumulative discounts and mathematical procedures for calculating discounted prices

In analyzing the process of determining the final price of shoes at Store A, which offers a double discount of 30%, followed by 20%, SR-1 demonstrated a systematic approach to applying discount calculations. SR-1 initially computes the 30% discount from the original shoe price of IDR 400,000, which equated to IDR 120,000. This was used to determine the price after the first discount, In the next step, SR-1 determined the cost of the shoes following the first discount, which amounts to 280,000.

Using the same procedure, SR-1 then calculated the second discount of 20%. The second discount was determined by multiplying 20% by the price after the first discount, which is 20% of 280,000, resulting in a discount of 56,000. In the final step, SR-1 applied the second discount to the price after the first discount, concluding that the final price of the shoes after receiving a double discount was IDR 224,000.

Store A applies a tiered discount system, requiring more complex calculations. In contrast, Store B offers a direct discount, which does not require sequential calculations. SR-1 demonstrated their knowledge of direct discounts, as evidenced by their accurate calculation of the price reduction directly applied to the shoe price, as shown in Figure 4.

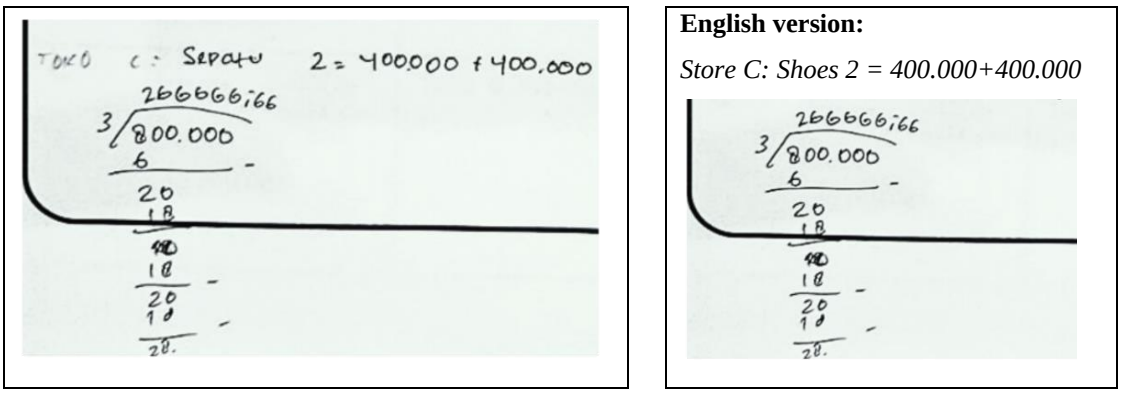


English version:
Store B

$$50\% := \frac{50}{100} \times 400.000 = 200.000$$
$$= 400.000 - 200.000$$
$$= 200.000$$

Figure 4. SR-1's understanding of direct discounts and mathematical procedures for calculating discounted prices

SR-1 displayed a solid understanding of the discount concept. This was evident from the way the student systematically and accurately followed three steps to calculate the discount, as illustrated in Figure 4. The first step involved converting the 50% discount into a fraction, $\frac{50}{100}$, to simplify multiplication with whole numbers. In the second step, SR-1 calculated the discount amount by multiplying the percentage discount by the shoe price, $\frac{50}{100} \times 400.000$, resulting in the correct discount value of IDR 200,000. In the final step, SR-1 subtracted the discount amount from the original shoe price, 400.000-200.000.

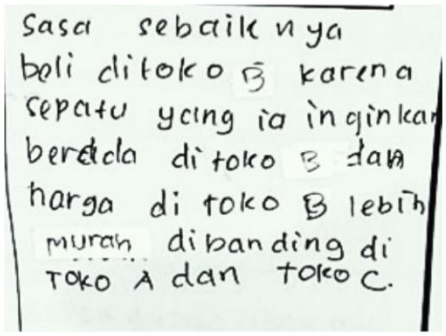


English version:
Store C: Shoes 2 = 400.000+400.000

Figure 5. SR-1's understanding of "Buy Two Get One Free" promotions and mathematical procedures for calculating prices

Store C offers a "Buy Two, Get One Free" promotion, which differs from the discount models provided by Store A and Store B. As shown in Figure 5, SR-1 misunderstood this type of discount. The

error occurred in the first step, where SR-1 added the prices of two pairs of shoes, IDR 400.000 + IDR 400.000, and then divided the total by three (the total number of pairs obtained), resulting in IDR 266.666,67. However, the actual amount Sasa should pay when choosing Store C is IDR 800,000. On the other hand, SR-1 made no mistakes in their mathematical calculations. SR-1's calculation process is presented in Figure 5.



English version:

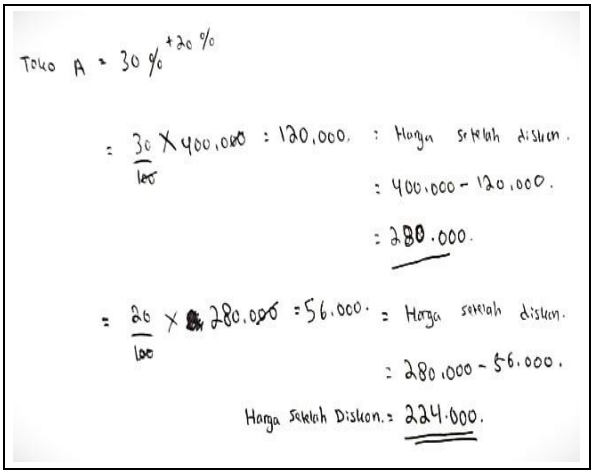
Store C
Sasa should buy from store B, because she wants the shoes in store B and store B is cheaper than store A and store C.

Figure 6. SR-1's recommendation on shoe store choices

SR-1 recommended Store B to Sasa based on mathematical calculations (as discussed earlier). The recommendation for Store B was grounded on its offering of the cheapest shoe prices, calculated using the applied mathematical procedures, as illustrated in Figure 6.

Student Response -2 (SR-2)

Similar to SR-1, SR-2 also demonstrated an understanding of the double discount concept. This understanding was evident from SR-2's calculations, where discounts were applied sequentially. The first discount of 30% was applied to the shoe price, followed by a second discount of 20% calculated from the price after the first discount, rather than simply adding the discount percentages together. SR-2's calculation process is presented in Figure 7.



English version:

Store A $= 30\% + 20\%$

$$= \frac{30}{100} \times 400.000 = 120.000$$

$= $ the price after dicsount

$$= 400.000 - 120.000$$
$$= 280.000$$

$$= \frac{20}{100} \times 280.000 = 56.000$$

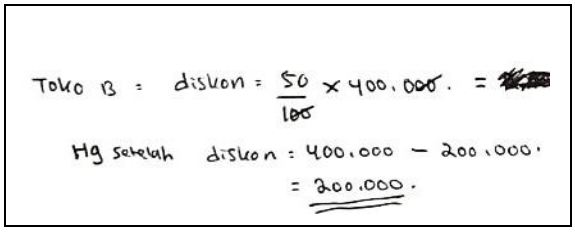
$= $ the price after discount

$$= 280.000 - 56.000$$

the price after discount $= 224.000$

Figure 7. SR-2's understanding of cumulative discounts and mathematical procedures for calculating discounted prices

From SR-2's response, it was clear that SR-2 understood the concept of direct discounts. As illustrated in Figure 8, SR-2 performed direct discount calculations on the shoe price. Like SR-1, SR-2 employed a systematic three-step method to calculate the direct discount accurately. The first step involved converting the 50% discount into a fraction, $\frac{50}{100}$. The second step entailed multiplying the fraction by the shoe price ($\frac{50}{100} \times 400.000$). Finally, SR-2 subtracted the calculated discount from the original shoe price (400.000 - 200.000).



English version:

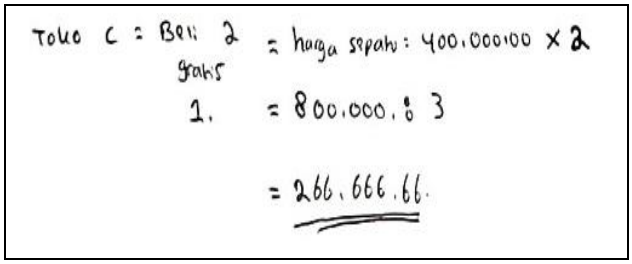
Store B = discount = $\frac{50}{100} \times 400.000$

Price after discount $= 400.000 - 200.000$

$= 200.000$

Figure 8. SR-2's understanding of direct discounts and mathematical procedures for calculating discounted prices

Subsequently, SR-2 exhibited an incomplete understanding of the "buy two, get one free" discount type. Figure 9 shows SR-2's calculation, where the total cost for shoes at Store C was calculated as IDR 266,666.66 (rounded to IDR 267,000) based on the assumption that one pair of shoes was free with the purchase of two pairs. However, the actual cost of one pair of shoes remains IDR 400,000, with one additional pair provided at no cost when buying two pairs (totaling IDR 800,000).



English version:

Store C

Buy 2 get 1free = the price of shoes

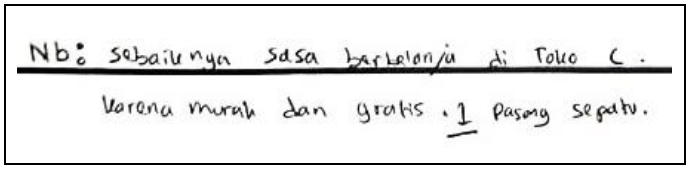
$= 400.000 \times 2$

$= 800.000 \div 3$

$= 266{,}666.66$

Figure 9. SR-2's understanding of the "Buy Two Get One Free" promotion and mathematical procedures for calculating prices

The final stage in completing the task involved providing a recommendation to Sasa. Although SR-2 used the same calculations and achieved the same results for each store as SR-1, SR-2 offered a different store recommendation, as illustrated in Figure 10. SR-2 suggested that Sasa purchase from Store C, reasoning that Sasa could acquire two pairs of shoes at a cheaper overall cost from this store.



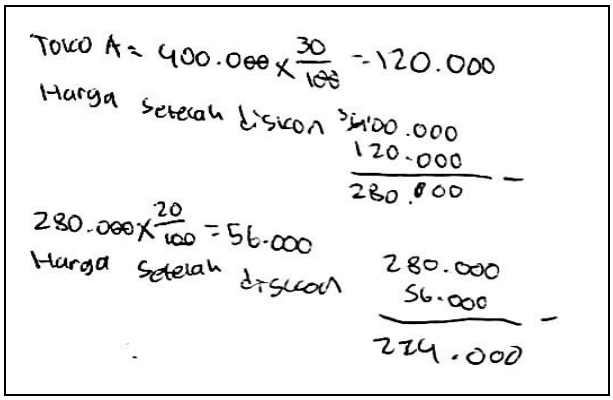
English version:

Sasa should shop at store C. Because it's cheap and offers one pair of shoes for free.

Figure 10. SR-2's recommendation on shoe store choices

Student Response -3 (SR-3)

The calculations performed by SR-3, as shown in Figure 11, demonstrate an accurate understanding of the double discount concept by applying the discounts sequentially. This understanding is similar to that shown by SR-1 and SR-2.



English version:

Store A $= 400.000 \times \frac{30}{100} = 120000$

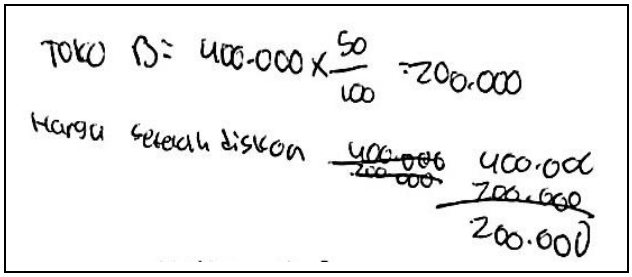
the price after dicsount $\begin{array}{r} 400000 \\ \underline{120000} \; - \\ 280000 \end{array}$

$280.000 \times \frac{20}{100} = 56.000$

the price after dicsount $\begin{array}{r} 280000 \\ \underline{56000} \; - \\ 244000 \end{array}$

Figure 11. SR-3's understanding of direct discounts and mathematical procedures for calculating discounted prices

In Figure 12, SR-3 correctly calculated 50% of the initial price (IDR 400,000) using the formula $400.000 \times \frac{50}{100} = 200.000$. SR-3 then accurately subtracted the discount value (IDR 200,000) from the initial price (IDR 400,000). This step resulted in a discounted price of IDR 200,000. This demonstrates the student's understanding of the systematic process of applying direct discounts. From this analysis, it can be concluded that the student possesses a solid understanding of direct discount applications.



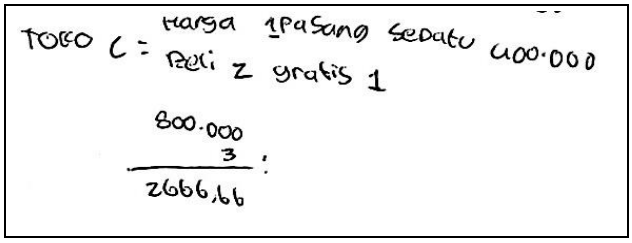
English version:

Store B = $400.000 \times \frac{50}{100} = 200.000$

the price after discount $\begin{array}{r} 400000 \\ \underline{200000} \; - \\ 200000 \end{array}$

Figure 12. SR-3 understanding of direct discounts and mathematical procedures for calculating discounted prices

Based on Figure 13, SR-3 understood that the "buy two, get one free" promotion involves dividing the total cost for three pairs of shoes. They attempted to calculate the average price per pair by using $\frac{800000}{3} = 266.666{,}67$. This calculation shows that SR-3 recognized the need to divide the total cost by the three pairs of shoes, but they did not fully grasp the fundamental concept of this promotion. While the calculation is mathematically correct, it does not entirely reflect a proper understanding of the promotion. In a "buy two, get one free" offer, one pair of shoes is indeed considered free, but the total price of IDR 800,000 applies only to the two pairs, not three.



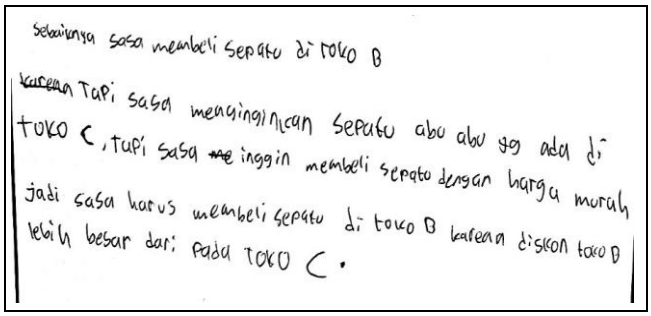
English version:

Store C
The price of one pair of shoes is 400,000, buy 2 get 1 free.

$$\begin{array}{r} 80000 \\ \hline 3 \\ \hline 2666{,}66 \end{array} :$$

Figure 13. SR-3's understanding of the "Buy Two, Get One Free" promotion and mathematical procedures for calculating discounted prices

SR-3 suggested that Sasa purchase shoes from Store B because it offered a larger discount, resulting in a lower price, as shown in Figure 14. This decision was clearly based on the mathematical calculations performed in the earlier activity. In terms of financial attitudes, SR-3 demonstrated an understanding of the importance of considering financial factors (choosing the lower price at Store B). However, this recommendation overlooked Sasa's specific preference for gray shoes available only at Store C. SR-3 failed to consider that Sasa's preference for the gray shoes at Store C was a crucial factor in her decision-making process.



English version:

Sasa should buy shoes from store B.
Sasa, on the other hand, wants the pair of gray shoes in store C, but she wants to pay a low price. So Sasa should buy the shoes from store B because the discount is greater than at store C.

Figure 14. SR-3's recommendation on shoe store choices

In this article, students were tasked with determining store recommendations based on varying discount types. In addition, students were faced with a choice between wants and needs, where the desire was to own gray shoes, but the cost was twice as high. Instilling the importance of distinguishing wants and needs is very important, ensuring students develop an awareness of consumer responsibility in financial services (OECD, 2019). Utilizing real-life contexts to teach financial mathematics is crucial. This idea is corroborated by research conducted by Dituri and colleagues (2019) emphasizing the need for comprehensive information to solve mathematical problems in financial contexts.

The findings of this study indicate that open-ended tasks with the "End Year Promo" context reveal students' misconceptions regarding the "Buy Two, Get One Free" concept. Impulsive behavior was observed in one sample, SR-2, who recommended that Sasa purchase shoes from Store C, which offered the "Buy Two, Get One Free" promotion. Mathematically, this promotion can be considered a discount on the total purchase (Gordon-Hecker et al., 2020). However, based on marketing theory, "Buy X, Get Y Free" is a promotional strategy where customers receive an additional product free of charge after purchasing the first product at full price (Thomas & Chrystal, 2013; Gordon-Hecker et al., 2020).

This finding aligns with Prayitno (2023), which attributes such errors to students assuming that the average price per pair applies to all three pairs without acknowledging that one pair is provided for free. Students failed to mention the relationship between the actual shoe price and the benefit of receiving one pair for free.

Moreover, the open-ended nature of this task allowed students the freedom to make decisions based on the presented problems. Such tasks are essential as they can be used to explore different strategies, deepen students' mathematical knowledge, and develop creative mathematical thinking. Based on three responses, the students demonstrated their understanding of how to calculate direct and cumulative discounts. This finding aligns with the research of Nusantara and Susanto (2016), which stated that intuitively, students already possess the knowledge that double discounts are calculated by finding the price after the first discount and then multiplying the result by the rate of the second discount. Furthermore, the student correctly applied the mathematical procedures to calculate price after the discount rate. Contrary to prior research, students were found to misinterpret double discounts as either a reduction in discounts rates or a simple summation of discount percentages, leading to calculation and decision-making errors (Prayitno, 2023). Subsequently, a mathematical error was made by one out of three respondents, who divided 800,000 by 3 and arrived at 2666.6. This finding aligns with the Level 1 financial literacy ranking in Indonesia stated in introduction, which indicates that students generally can perform multiplication, addition, and subtraction operations but still face challenges with division operations in solving financial problems (OECD, 2019). Mathematically, previous studies also showed that students often struggle with using zero in the long-division, with one common explanations for such systematic computational errors being an incorrect or weak understanding of place value (Lamb & Booker, 2004).

Building on the challenges students face with financial decision-making and mathematical skills, the open-ended framework provides opportunities to enhance students' understanding by integrating mathematical concepts with real-life financial contexts through class discussions and teacher guidance. Figure 15 briefly illustrates how an open-ended task involving class discussion with teacher guidance can provide students with knowledge and understanding of financial literacy terms. Furthermore, students use this knowledge and understanding to make financial literacy-related decisions using appropriate mathematical procedures. Moreover, the teacher's role is important in providing information about financial terms used in the task design, minimizing the potential for student errors in understanding and interpreting financial terms that could affect their decision-making. The financial context employed should not merely serve as a camouflage for teaching mathematical concepts and financial knowledge (Savard, 2022b; Savard & Polotskaia, 2017). If this happens, students may make incorrect financial decisions; for example, students might fail to understand the application of percentage discounts (Sagita et al., 2023b; Savard, 2022a).

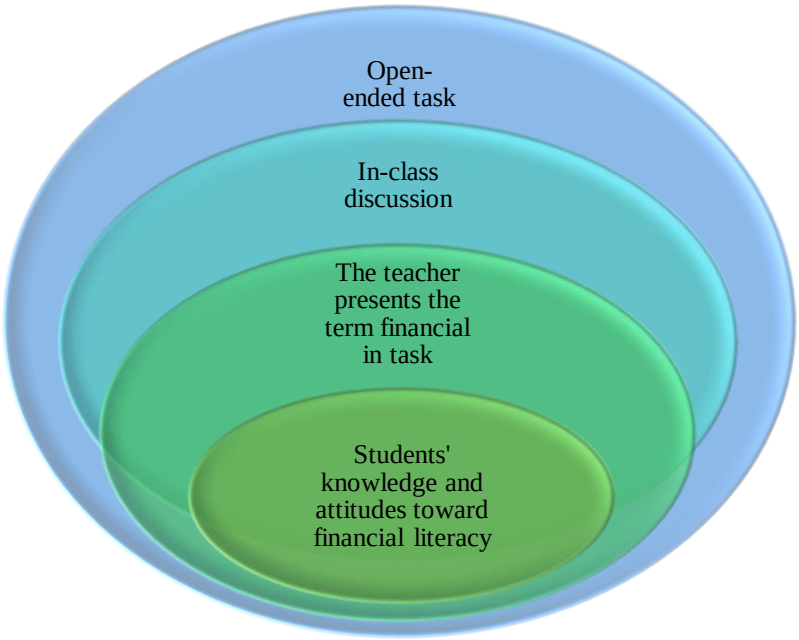


Figure 15. Visualization of open-ended task design has an impact on students' financial literacy

Properly organizing the class can facilitate student discussions and the exchange of opinions to determine the most appropriate decisions. Setianingsih and her colleagues (2017) showed that even 'difficult material' can be successfully understood and constructed by students through class discussions. In addition, discussions enable students to recognize and remember reasonable explanations given by their peers during the process. One of the limitations of this study is the lack of comprehensive interviews conducted by researchers with subjects who commit errors. Therefore, further research could explore the impact of using various forms of price reduction to gain a deeper understanding of students' decision-making processes. In addition, teachers must cultivate an environment conducive to learning, where students feel comfortable articulating their understanding of the problem. This can help identify the most suitable approaches for solving the problem effectively.

CONCLUSION

The results indicate that the implementation of an open-ended task has the potential to facilitate understanding of financial decision-making and mathematical skills. This is addressed through open-ended tasks that have problem characteristics such as having a connection between mathematical concepts and real-world financial scenarios, the problems given are related to financial decision-making in students' daily lives and do not have a single answer, and promoted by teacher guidance through collaborative class discussions.

Students were able to differentiate between needs and wants, which is an important aspect in making responsible financial decisions. However, some students still showed conceptual errors, such as misunderstanding the ‘buy two get one free’ promotional strategy as an immediate discount without

considering the total price. These errors indicate the need for teacher guidance in explaining relevant financial terms and mathematical procedures to support more accurate decision-making. In addition, this study also revealed students' understanding of the application of basic arithmetic, including percentages and fractions, in solving financial problems. Although most students were able to apply the correct mathematical procedures, some still made conceptual errors, such as misunderstanding promotion or division strategies, indicating the need for further guidance from teachers.

These results emphasize the importance of integrating open-ended tasks in financial literacy learning to train students to use mathematical concepts relevantly in everyday life, while supporting the development of their analytical and problem-solving skills. The study also highlights the importance of ensuring that the financial context in mathematics learning does not become 'camouflage' but actually helps students understand the relationship between mathematical concepts and real-life situations. As a follow-up, future research is recommended to involve more in-depth interviews with students to further explore the reasons behind their errors. In addition, the development of more varied task designs can be explored to provide a more comprehensive understanding of the influence of open-ended questions in improving students' financial literacy.

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