

## ERROR ANALYSIS OF STUDENTS IN SOLVING THE PISA FINANCIAL LITERACY QUESTIONS

**Titik Ulfatun<sup>1</sup>, Tifany Larasati Dewi<sup>2</sup>, Zulfa Izzatun Nikmah<sup>3</sup>, Sengaloun Xaphakdy<sup>4</sup>, Sinabajije Alphonse<sup>5</sup>**

<sup>1,2,3</sup> Accounting Education Study Program, Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta

<sup>4</sup> Faculty of Law and Political Science, National University of Laos

<sup>5</sup> District Director of Education, Nyamasheke District, Republic of Rwanda  
email: titik.ulfatun@ums.ac.id

### ABSTRACT

Financial literacy is an important literacy for students. However, there are still many Indonesian students who cannot be completely correct in solving the Programme for Internasional Student Assessment financial literacy questions. The aim of this study is to analyze students' errors in answering the PISA financial literacy questions. In this qualitative research, the researcher gave financial literacy questions to Grade VIII students of SMP Negeri 189 Jakarta where the questions were at levels 3, 4, and 5. These questions are based on the examples of financial literacy questions issued by the Organisation for Economic Co-operation and Development where these questions can be used as a trial or exercise. Error analysis in solving PISA financial literacy questions used Newman Error Analysis. This research involved 33 students of class VIII SMP Negeri 189 Jakarta. Data collection techniques used test questions, interviews, and documentation. Data analysis techniques included: data managing; reading, memoing; describing, classifying, interpreting; and representing, visualizing. The results of this study indicate that the level of financial literacy knowledge of students at SMP Negeri 189 Jakarta is classified as low. Identification of difficulties found 121 mistakes made by students, 34.7% made mistakes in transformation (42 errors), 27.3% made mistakes in process skill (33 errors), 24.8% made mistakes in comprehension (30 errors), while the rest or around 13.2% made mistakes in encoding (16 errors). Future research is needed to find out what factors influence students' financial literacy.

**Keywords:** *PISA, financial literacy, student difficulties*

Received: 20 Mei 2023

Accepted: 23 juni 2023

Published: 30 Juni 2023

## INTRODUCTION

The Organisation for Economic Co-operation and Development (OECD) first initiated Programme for International Student Assessment (PISA) in 2000. PISA is an international survey that is held every 3 years which aims to evaluate education systems around the world by testing the abilities and knowledge of students aged 15 years (Kemendikbud, 2019). Assessment in this PISA covers reading, mathematics, and science, as well as other innovative fields such as creative problem solving, collaborative problem solving, global competence, and creative thinking (OECD, 2020). In addition to the three main areas, another area was offered as an option PISA in 2018, which was financial literacy. This optional assessment was followed by 20 countries and economies. Students in participating countries and economies are assessed to what extent they have the knowledge and abilities, acquired both inside and outside of school, that are important for making financial decisions and planning for their future (OECD, 2020).

The OECD (2020) defines financial literacy is the knowledge and comprehension of financial concepts and risks, as well as the abilities, drive, and self-assurance to apply this knowledge and understanding to make wise decisions in a variety of financial contexts, enhance one's own and society's financial well-being, and enable participation in the economy. A similar understanding was also stated by the Ministry of Education and Culture of the Republic of Indonesia through the National Literacy Movement. Financial literacy refers to the ability to use knowledge of concepts and hazards, to make decisions that will improve one's own and others' financial well-being, and to participate in society (Ministry of Education and Culture, 2017). Moreover, they said that one of financial literacy indicators is the increase of financial literacy score at school which can be seen through the results of survey based on the Indonesia Financial Services Authority. In addition, Sopanah et al. (2020) also defines financial literacy as the ability to evaluate and make effective decisions regarding money management. In short, financial literacy is knowledge and skills about money that anyone can boldly acquire.

The OECD (2020) stated that financial education plays a part in empowering individuals with the knowledge and abilities necessary to comprehend more complicated products and services, select those that are most suitable for them, and protect themselves, in addition to financial consumer protection and regulations. Financial literacy is very important for everyone because financially literate people have proven that they can survive tough economic times (Dhandayuthapani & Vinothkumar, 2020). Financial literacy can support the growth of everyone's financial wealth. For example, sufficient financial education can help determine the right investment product according to your needs and abilities, so that this income can be used to increase welfare in the future (Financial Services Authority, 2022).

The results of PISA financial literacy in 2018 show that there is a difference of 159 points in the average financial literacy score between the country with the highest score (Estonia=547 points) and the country with the lowest score (Indonesia=388) (OECD, 2020). Furthermore, this gap indicates a marked difference

in the ability of 15-year-olds to make sound financial decisions. Table 1. shows the results of the 2018 PISA financial literacy average scores:

Table 1.  
2018 PISA Financial Literacy Average Score

No	Country name	Average Score
1	Estonia	547
2	Finland	537
3	You have	532
4	Poland	520
5	Australia	511
6	America	506
7	Portugal	505
8	Latvia	501
9	Lithuania	498
10	Russia	495
11	Spanish	492
12	Republic Slovakia	481
13	Italy	476
14	Chili	451
15	Serbia	444
16	Bulgaria	432
17	Brazil	420
18	Peru	411
19	Georgia	403
20	Indonesia	388

Source: OECD (2020)

Indonesia is one of the countries that has participated in PISA since 2000. However, this is the first time for Indonesia to take part in the 2018 PISA financial literacy assessment. With this first participation, it turns out that the assessment results obtained were not satisfactory. Indonesia is the last ranked country with a score below the average score of the participating countries and economies. The results of this assessment can be a new input for the government, in this case the Ministry of Education and Culture and related parties to always make meaningful improvements to improve the quality of Indonesian education. Table 2 shows the results of Indonesia's 2018 PISA financial literacy based on achievements per level (level 1 – 5, lowest – highest).

Table 2.  
Achievements per Level of Financial Literacy PISA 2018 Indonesia

Level	Information
Level 1: Students can identify common financial products and terms and interpret information related to basic financial concepts. They can recognize the difference between a need and a want and can make simple	More than half (57%) of students in Indonesia are at Level 1 or below in financial literacy. Level 1 is the proficiency level most

Level	Information
<p>decisions for day-to-day expenses. They can recognize the purpose of everyday financial documents, such as invoices, and apply single and basic numerical operations (addition, subtraction, or multiplication) in financial contexts they may find themselves familiar with.</p>	<p>frequently seen among 15 year old students.</p>
<p>Level 2: Students begin to apply their knowledge of common financial products and commonly used financial terms and concepts. They can use the information provided to make financial decisions in the context that is relevant to them. They can recognize the value of a simple budget and can interpret the salient features of everyday financial documents. They can apply a single basic numerical operation, including division, to answer financial questions. They demonstrate an understanding of the relationship between different financial elements, such as amounts used and expenses incurred.</p>	<p>Only 43% of students in Indonesia are proficient at Level 2 or above in financial literacy or less than one in two students in Indonesia have the basic skills involved in making responsible and well-informed financial decisions.</p>
<p>Level 3: Students can apply their understanding of commonly used financial concepts, terms, and products to situations that are relevant to them. They begin to consider the consequences of financial decisions and they can make simple financial plans in familiar contexts. They can make live interpretations of various financial documents and can apply various basic numerical operations, including calculating percentages. They can select the numerical operations needed to solve routine problems in relatively common financial literacy contexts, such as budget calculations.</p>	<p>Only 15% of students in Indonesia demonstrate at least Level 3 proficiency.</p>
<p>Level 4: Students can apply their understanding of less common financial concepts and items to contexts that will be relevant to them as they grow up, such as managing bank accounts and compounding interest in savings products. They can interpret and evaluate detailed financial documents, such as bank statements, and explain infrequently used functions of financial products. They can make financial decisions with long-term consequences in mind, such as understanding the overall cost implications of repaying a loan over a longer period of time, and they can solve routine problems in less common financial contexts.</p>	<p>Fewer than one in ten Indonesian students are at Level 4 or above.</p>

Level	Information
<p>Level 5: Students can apply their understanding of various financial terms and concepts to contexts that may only be relevant to their lives in the long term. They can analyze complex financial products and can consider significant but unstated or indirectly evident features of financial documents, such as transaction costs. They can work with a high degree of accuracy and solve non-routine financial problems, and they can describe the potential outcomes of financial decisions, demonstrating an understanding of the wider financial landscape, such as income taxes.</p>	<p>Fewer than 1% of students, or less than 1 in 100, score high in Georgia and Indonesian.</p>

Source: OECD (2020)

Based on Table 2, it can be seen that there are still many Indonesian students who cannot be completely correct in solving the PISA financial literacy assessment questions. This is evidenced by the few students who are able to reach levels 3, 4, and 5. Therefore, it is necessary to analyze student errors in solving the PISA financial literacy test questions as a first step in identifying problems so that solutions can be found in solving PISA financial literacy problems.

One of the schools that participated in the 2018 PISA assessment was SMP Negeri 189 Jakarta. Students aged 15 years became respondents to the PISA survey. In this study, researchers gave financial literacy questions to Grade VIII students where these questions are at levels 3, 4, and 5. These questions come from examples of financial literacy questions issued by the OECD where these questions can be used as trials or exercises. Error analysis in solving PISA financial literacy questions used Newman Error Analysis. Error analysis on PISA financial literacy questions has not been widely carried out in previous studies. The research results from Wijayanti & Retnawati (2020) showed that there were 112 mistakes made by students in answering financial literacy questions where 43 mistakes (38.39%) were coding errors, 20 mistakes (17.86%) were process skills errors, 22 errors (19.64%) were transformation errors, and 27 errors (24.11%) were comprehension errors. The aim of this study is to analyze the errors of class VIII students of SMP Negeri 189 Jakarta in solving PISA financial literacy questions.

## RESEARCH METHOD

This research uses qualitative methods that aims to analyze the errors of class VIII students of SMP Negeri 189 Jakarta in solving PISA financial literacy questions. In this qualitative study, data are frequently gathered by researchers in the field at the location where participants encounter the topic or issue being studied (Creswell, 2013). The PISA financial literacy questions in this study were questions at levels 3, 4, and 5. At level 3, the questions tested were questions about invoice units (1 question at level 3), questions about ringtones (1 question at level 4), and

questions about bank statements (1 question at level 5). The questions are taken from examples of financial literacy questions that have been officially issued by PISA for trial or exercise purposes which have been translated and adapted into Indonesian. This research involved 33 students of class VIII SMP Negeri 189 Jakarta. Data collection techniques using test questions, interviews, and documentation. Data analysis techniques used include data managing; reading, memoing; describing, classifying, interpreting; and representing, visualizing (Creswell, 2013).

By using students' test answers, the researcher ranked students' financial literacy knowledge and identified students' difficulties in solving problems related to financial literacy. Chen & Volpe (1998) classifies the mean percentage of correct scores of financial literacy test into three, namely: 1) below 60%, which means students have a relatively low level of knowledge; 2) 60% – 79%, which means that students' financial literacy is classified as a medium level of knowledge; and 3) more than 80%, which indicates that students have a relatively high level of knowledge (see Table 3).

Table 3.  
Classification of Level of Financial Literacy Knowledge

Description	Category
Mean percentage of correct scores below 60%	Low
Mean percentage of correct scores below 60% - 79%	Medium
Mean percentage of correct scores more than 80%	High

Newman Error Analysis (NEA) is a procedure used to analyze errors in written assignments where this procedure was first introduced by M. Anne Newman, an Australian educator, in 1977 (Clements & Ellerton, 1996). The NEA provides a framework for considering the reasons underlying students' difficulties with math word problems and a process that helps teachers to determine where misunderstandings occur (White, 2010). The NEA used in this research because financial literacy questions in this study have similar characteristics with math problems.

NEA was used to analyze student errors in solving PISA financial literacy questions. Newman (in Clements & Ellerton, 1996; McMahan, n.d.; White, 2010) reveals that there are five steps that can be used to solve math problems.

a. Reading

Errors in reading occur when students cannot read the key words or symbols in the questions that prevent them from going further in answering the questions.

b. Comprehension

Errors in comprehension at this stage occur if students cannot understand the meaning of the words in the question to solve the problem.

c. Transformation

Transformation errors occur when students are unable to identify the correct operation or process required to solve a problem.

d. Process Skill

Errors at this stage occur when students are unable to complete a set of operations required to answer the question correctly even though they are only able to identify the operations.

e. Encoding

Errors at this stage can occur if students cannot present answers in an appropriate format even though they are able to answer the questions correctly.

**RESULTS AND DISCUSSION**

In classifying students' correct answers, the researcher used Chen & Volpe (1998) method which grouped students' abilities into three categories, namely low (below 60%), medium (60%-79%), and high (more than 80%). Table 4 shows the percentage level of correct answers for each question and mean correct response of overall questions. It can be seen that both level of financial literacy knowledge and overall mean of correct response are on the low categories. For Invoice units (1 question at level 3), there are 8 out of 33 students (27.3%) who answer correctly. For Ringtones units (1 question at level 4), there are 18 out of 33 students (54.5%) who response correctly. For Bank statements units (1 question at level 5), there are only 2 out of 33 students (6.1%) who have full credit for the correct answer. The overall mean correct response of students is 29.3% which is categorized as low level of knowledge.

Table 4.  
Mean Percentage of Correct Response

Unit	Level of Financial Literacy Knowledge		
	Low	Medium	High
Invoice (1 question at level 3)	27.3%	-	-
Ringtones (1 question at level 4)	54.5%	-	-
Bank statements (1 question at level 5)	6.1%	-	-
Mean Correct Response	29.3%	-	-

PISA classifies students' ability to solve financial literacy questions into 5 levels. However, in this study the researcher will only analyze student errors in solving financial literacy questions at three levels, namely.

1. Level 3 is represented in a question of invoice units. In this case, students are expected to be able apply their understanding of less common financial concepts to contexts that will be relevant to them as they grow older.
2. Level 4 is shown in the question of ringtone units where students are asked to pay attention and interpret the mini notes to understand the terms and conditions of using a service, then calculate the implications for the actual cost.
3. At level 5, students are asked to analyze complex financial products and can take document features, such as transaction costs which is shown by a question of bank statement units.

In summary, the test results of the three questions given to students are presented in Table 5, as follows.

Table 5.  
Financial Literacy Test Results Based on Questions Level

Level	Percentage of Students							
	Full Credit		Partial Credit		Incorrect		Unanswered	
	n	%	n	%	n	%	n	%
3	9	27.3%	-	-	20	60.6%	4	12.1%
4	18	54.5%	-	-	11	33.3%	4	12.1%
5	2	6.1%	3	9.1%	12	36.3%	16	48.5%
Mean		29.3%		3%		43.4%		24.2%

Based on Table 5, it can be seen that the total percentage of average students with full credit and partial credit (32.3%) is fewer than the total percentage of average students who answered incorrectly and did not answer. This might indicate that students experience difficulties in solving problems related to the PISA financial literacy questions at level 3, 4, and 5. Therefore, to identify student difficulties, it is necessary to analyze errors made by students using NEA. Table 6 presents the analysis of student errors using NEA by excluding students who do not answer (blank answers).

Table 6.  
Error Analysis Results Newman

Type of Error	Level 3		Level 4		Level 5		Total	
	n	%	n	%	n	%	n	%
Reading	0	0	0	0	0	0	0	0
Comprehension	8	6.6	10	8.3	12	9.9	30	24.8
Transformation	19	15.7	11	9.1	12	9.9	42	34.7
Process Skill	9	7.4	12	9.9	12	9.9	33	27.3
Encoding	3	2.5	10	8.3	3	2.5	16	13.2
Total	39	32.2	43	35.5	39	32.2	121	100

Based on Table 6, the study found 121 errors and the number is likely to increase if unanswered questions are included. Not all students make reading mistakes at all levels of financial literacy. Most of the mistakes made by students were found in level 4 PISA questions, which were 43 errors. However, this cannot be concluded generally because in the level 5 of PISA questions more students did not provide answers. Overall, the biggest error is in the type of Transformation error, which is equal to 34.7%. The explanation of the type of error based on NEA is described as follows.

### **Error in Reading**

Error in Reading usually occurs when students cannot read the keywords or symbols in the question, which prevents them from going further in answering the



questions. In this study, the researchers found no errors reading on student answers.

### **Error in Comprehension**

Error in Comprehension at this stage occur if students cannot understand the meaning of the words in the question to solve the problem. Other errors can be seen from the inability of students to write down information that is appropriate to the problem to help solve the problem. Figure 1 is an example of student answers that have errors in comprehension.

Collin melihat sebuah iklan di majalah remaja.

Dapatkan nada dering "Cheeky Monkey" untuk ponsel Anda.  
Ponsel Anda akan mengeluarkan suara monyet saat teman Anda menelepon.  
Dapatkan sekarang hanya dengan Rp 300\*



SMS kata MONK ke 131309 🙊

\*setiap nada dering berharga Rp 300. Dengan mengirim SMS kata MONK ke 131309, pelanggan setuju untuk menerima nada dering "Cheeky Monkey" yang berbeda setiap hari. Pelanggan dapat membatalkan kontrak kapan saja dengan SMS kata STOP ke 131309. Biaya pembatalan adalah Rp 500.

#### **Pertanyaan :**

Collin punya pulsa Rp 3.000 di ponselnya. Dia mengirim SMS kata MONK ke 131309. Collin tidak menggunakan ponselnya lagi untuk menelepon atau mengirim SMS. Dia tidak menambahkan biaya lagi, berapa pulsa yang dimiliki Collin di ponselnya satu minggu kemudian?

2.500, mungkin saja dia membatalkan kontrak dan membayar sebesar Rp.500

Figure 1.  
Example Student Answers Error Comprehension

Figure 1 shows that student does not understand the intent of the question properly. In this problem, students are asked to determine Collin's remaining credit after a week of activation of the ringtone and do not use the phone for any other purpose.

That student actually gave unsolicited answers to the questions. She/He responded about the cancellation of contracts ringtone. That is clearly not the problem in this question. Thus, it is clear that 'what is given' by the student is not relevant to 'what is asked' in the question.

### **Error in Transformation**

Error in Transformation usually occurs when students are unable to identify the correct operation or process required to solve the problem. In term of invoice units, students are asked to recalculate the total cost of a new invoice because the items ordered and sent are different from the invoice listed. The question already stated the freight cost and taxes. Figure 2 represents example of error in transformation done by the student.

Sarah menerima faktur ini melalui pos

**BREEZY CLOTHING**

Faktur  
Nomor Faktur : 2034  
Tanggal dikeluarkan : 28 Februari  
PT. Breezy Clothing  
Jl. Mawar Kamboja  
Jakarta Timur, 28

Sarah Johanson  
Jl. Maju Tak Gentar  
Jakarta Barat, 112

Kode	Keterangan	Kuantitas	Biaya per Unit	Total (belum termasuk pajak)
T011	Kaos	3	Rp 20.000	Rp 60.000
J023	Jeans	1	Rp 60.000	Rp 60.000
S002	Syal	1	Rp 10.000	Rp 10.000

Total (belum termasuk pajak) : Rp 130.000  
Pajak (10%) : Rp 13.000  
Ongkos Kirim : Rp 10.000  
Total (setelah pajak) : Rp 153.000  
Sudah dibayar : Rp 0

Total jatuh tempo : Rp 153.000  
Tanggal jatuh tempo : 31 Maret

**Pertanyaan 3 :**

Sarah memperhatikan bahwa Breezy Clothing membuat kesalahan pada tagihan. Sarah memesan dan menerima dua kaos, bukan tiga. Ongkos kirimnya tetap, berapa total biaya pada faktur baru?

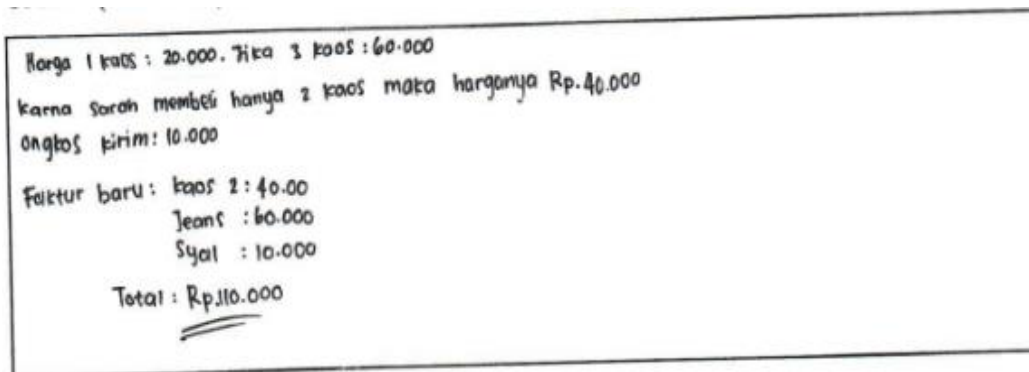


Figure 2.  
Examples of Student Answers Errors in Transformation

In Figure 2, it is clear that students are able to determine the price of one shirt, which is Rp20,000 and calculate the prices of other goods correctly. However, that student is not able to understand that shipping costs and taxes must still be calculated in solving new invoice problems.

**Error in Process Skill**

Errors at this stage occur when students are unable to complete a set of operations required to answer the question correctly even though they are only able to identify the operations. Figure 3 shows an example of an error process skill demonstrated by the student in this study.

Sarah menerima faktur ini melalui pos

**BREEZY CLOTHING**

Faktur  
Nomor Faktur : 2034  
Tanggal dikeluarkan : 28 Februari  
PT. Breezy Clothing  
Jl. Mawar Kamboja  
Jakarta Timur, 28

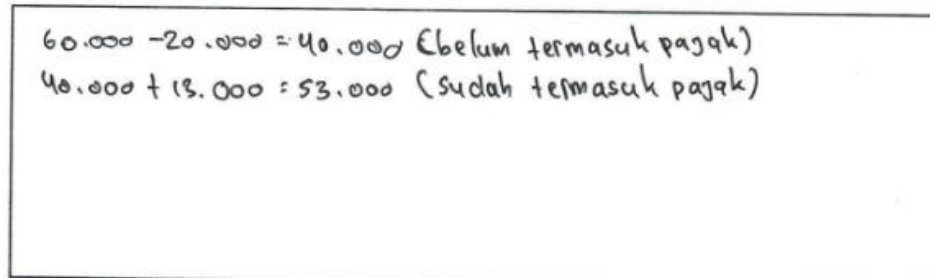
Sarah Johanson  
Jl. Maju Tak Gentar  
Jakarta Barat, 112

Kode	Keterangan	Kuantitas	Biaya per Unit	Total (belum termasuk pajak)
T011	Kaos	3	Rp 20.000	Rp 60.000
J023	Jeans	1	Rp 60.000	Rp 60.000
S002	Syal	1	Rp 10.000	Rp 10.000

Total (belum termasuk pajak) : Rp 130.000  
 Pajak (10%) : Rp 13.000  
 Ongkos Kirim : Rp 10.000  
 Total (setelah pajak) : Rp 153.000  
 Sudah dibayar : Rp 0  
  
 Total jatuh tempo : Rp 153.000  
 Tanggal jatuh tempo : 31 Maret

**Pertanyaan 3 :**

Sarah memperhatikan bahwa Breezy Clothing membuat kesalahan pada tagihan. Sarah memesan dan menerima dua kaos, bukan tiga. Ongkos kirimnya tetap, berapa total biaya pada faktur baru?



60.000 - 20.000 = 40.000 (belum termasuk pajak)  
40.000 + 13.000 = 53.000 (sudah termasuk pajak)

Figure 3.  
Examples of Student Answers Errors in Process Skill

Based on Figure 3, the student is already able to determine the price for two shirts, but she/he does not add the price with other items that were also ordered by Sarah, shipping cost, and the correct taxes. The student's answers only focused on the price of shirts without seeing other things that affect it.

***Error in Encoding***

Encoding error is an error that can occur if students cannot present answers in an appropriate format even though they are able to answer the questions correctly. Figure 4 shows an example of an error in Encoding when answering question of bank statement units.

Setiap minggu, Bu Maya mentransfer Rp 130.000 ke rekening bank putranya. Di Zedland, bank mengenakan biaya untuk setiap transfer. Bu Maya menerima pernyataan ini dari bank nya pada November 2022.

ZEDBANK				
Pernyataan untuk : Bu Maya			Jenis Akun : Saat ini	
Bulan : November 2022			Nomor Rekening : Z0005689	
Tanggal	Transaksi	Kredit	Debit	Total
1 Nov	Saldo Awal			Rp 1.780.250
5 Nov	Upah	Rp 575.000		Rp 2.355.250
5 Nov	Transfer		Rp 130.000	Rp 2.225.250
5 Nov	Biaya Tranfer		Rp 1.500	Rp 2.223.750
12 Nov	Upah	Rp 575.000		Rp 2.798.750
12 Nov	Transfer		Rp 130.000	Rp 2.668.750
12 Nov	Biaya Tranfer		Rp 1.500	Rp 2.667.250
13 Nov	Penarikan		Rp 165.000	Rp 2.502.250
19 Nov	Upah	Rp 575.000		Rp 3.077.250
19 Nov	Transfer		Rp 130.000	Rp 2.947.250
19 Nov	Biaya Tranfer		Rp 1.500	Rp 2.945.750
26 Nov	Upah	Rp 575.000		Rp 3.520.750
26 Nov	Transfer		Rp 130.000	Rp 3.390.750
26 Nov	Biaya Tranfer		Rp 1.500	Rp 3.389.250
27 Nov	Penarikan		Rp 180.000	Rp 3.209.250
27 Nov	Biaya sewa		Rp 1.200.000	Rp 2.009.250
30 Nov	Bunga	Rp 6.100		Rp 2.015.350

Pertanyaan :

Transaksi berikutnya terjadi pada tanggal 3 Desember:

- Gaji sebesar Rp 575.000 disetorkan ke rekening Bu Maya
- Bu Maya mentransfer Rp 130.000 ke rekening anaknya

Bu Maya tidak melakukan transaksi lain pada tanggal 3 Desember. Berapa saldo bank barunya pada penutupan akun tanggal 3 Desember? (saldo dalam rupiah)

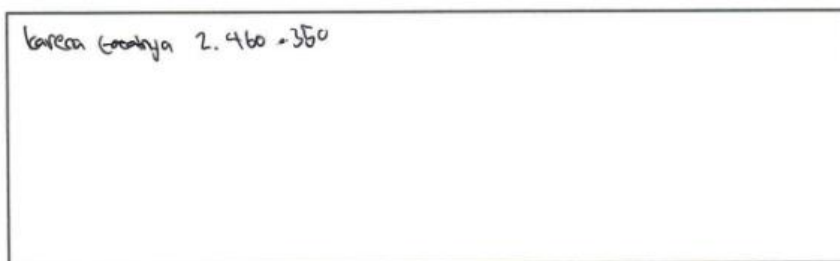


Figure 4.  
Examples of Student Answers Errors in Encoding

In Figure 4, that student seems only able to answer questions correctly but cannot provide explanations according to what is expected. This might happen because she/he is too confused to express her/his thoughts in a certain format even though she/he is able to understand the questions given.

Based on the results, the financial literacy knowledge of class VII students at SMP Negeri 189 Jakarta is classified as low. This might be caused by many factors, including the learning process in schools that might not teach financial literacy in more depth and a lack of practice questions for students. Financial literacy education must be given to students from an early age so they can make financial decisions correctly later in life. This opinion is in line with research by Mendari & Suci (2013) which states that financial literacy education must be given early, because if it is given at a higher level of education it will not be enough. In addition, the benefits of financial literacy education if given early will help children learn to balance needs and wants, and train children to manage money wisely (Sari et al., 2013).

The results of NEA indicate that in this study no errors were found in Reading step. This is in accordance with research conducted by Hadi et al. (2018) and Santoso et al. (2017). Both stated that the errors made by students when solving problems were errors in Comprehension, Transformation, Process Skill, and Encoding. In this study, it can be found that there were no Reading errors. It might be because the subjects were junior high school students whose reading skills were good.

In this study, the most errors are found in Transformation stage followed by an error in Process Skill, Comprehension, and Encoding. This result differs from that of (Sari & Valentino, 2016) who find that the most common mistake in solving PISA problem is encoding error. Error in Transformation had the highest score, namely 42 out of 121 errors (34.7%). Error in Transformation often happens in many cases where students are wrong in choosing the right formula or approach in solving the problem at hand. This shows that the difficulties of students in solving PISA financial literacy questions are still high. This case might be caused by the lack of financial literacy knowledge possessed by students. Furthermore, error in Process Skill is the second most error found in this study, namely as many as 33 errors out of 121 errors (27.3%). If many errors are found in this stage, this might bring up many other errors in Encoding. On the other hand, Hidayati et al. (2019) said that a common error is in Comprehension. In this study, errors in Comprehension become the third most errors found. Additionally, Utama et al. (2019) mentioned that factors that contribute to students being less precise when solving PISA problems are: students who are not accustomed to writing down information about questions, students who are not careful when determining the completion strategy, students' accuracy in performing calculations, and students' lack of precision in writing conclusions. Overall, according to Retnawati et al. (2018), many efforts can be made to overcome student difficulties in financial literacy questions, such as increase the understanding of teachers and students in the field of financial literacy. Likewise,

Sari (2018) argued that one way to increase financial literacy of students is by adapting financial literacy into curriculum.

## CONCLUSION

Students' financial literacy knowledge of SMP Negeri 189 Jakarta is classified as low. This indicates that many of students are unable to answer the PISA financial literacy questions at Level 3, 4, and 5 correctly. There are 27.3% of students who correctly respond for the Invoice modules (level 3). There are (54.5%) of students who correctly respond for the Ringtones modules (level 4). Only 6.1% of students in the Bank statements courses (level 5) received full credit for the right response. The results of NEA show that the Transformation step has the most errors, followed by errors in Process Skill, Comprehension, and Encoding. Based on the findings, it is suggested that school and teachers need to strengthen the students' knowledge of financial literacy in their teaching and learning process. This research is limited to the classification of financial literacy knowledge of students and error analysis of students in solving PISA financial literacy questions. It is still unknown what factors cause students' low financial literacy. Future research is expected to find out what factors influence students' financial literacy. In addition, this study was limited to one school and therefore this does not represent all schools.

## REFERENCES

- Chen, H., & Volpe, R. P. (1998). An Analysis of Personal Financial Literacy Among College Students. *Financial Services Review*, 7(2), 107–128. [https://doi.org/https://doi.org/10.1016/S1057-0810\(99\)80006-7](https://doi.org/https://doi.org/10.1016/S1057-0810(99)80006-7).
- Clements, M. A., & Ellerton, N. F. (1996). *The Newman Procedure for Analysing Errors on Written Mathematical Tasks*. The University of Newcastle: Faculty of Education. <http://www.compasstech.com.au/ARNOLD/PAGES/newman.htm>.
- Creswell, J. W. (2013). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches* (3rd Edition). SAGE Publications, Inc.
- Dhandayuthapani, S. P., & Vinothkumar, N. (2020). *Financial Literacy and Its Determinants. International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 8(VII), 1174–1179. <https://doi.org/10.22214/ijraset.2020.30445>.
- Hadi, S., Retnawati, H., Munadi, S., Apino, E., & Wulandari, N. F. (2018). The Difficulties of High School Students in Solving Higher-Order Thinking Skills Problems. *Problems of Education in the 21st Century*, 76(4), 520–532. <https://doi.org/10.33225/pec/18.76.520>.

- Hidayati, V. R., Maulyda, M. A., Rahmawati, D., Nabilah, R. G. S., Suhendra, S., & Yulianti, K. (2019). Analysis of The Difficulty of VIII th Grade Junior High School Students in Circle Material Reviewed from The Mathematics Connection Ability. *Journal of Physics: Conference Series*, 1397 012086. <https://doi.org/10.1088/1742-6596/1397/1/012086>.
- Kemendikbud, B. (2019). Pendidikan di Indonesia Belajar dari Hasil PISA 2018. *Pusat Penilaian Pendidikan Balitbang Kemendikbud*, 021, 1–206.
- Kementerian Pendidikan dan Kebudayaan. (2017). *Materi Pendukung Literasi Finansial*. Kementerian Pendidikan dan Kebudayaan.
- McMahon, A. (n.d.). *Incorporating Literacy in Mathematics Using Newman's Prompts*. Renaissance. <https://www.renaissance.com.au/2021/09/29/incorporating-literacy-in-mathematics-using-newmans-prompts-2/>.
- Mendari, A. S., & Suci, K. S. (2013). Tingkat Literasi Keuangan di Kalangan Mahasiswa STIE Musi. *Jurnal Economia*, 9(2), 1–11.
- OECD. (2020). *PISA 2018 Results: Are Students Smart About Money? Vol. IV*. <https://doi.org/https://doi.org/10.1787/48ebd1ba-en>.
- Santoso, D. A., Farid, A., & Ulum, B. (2017). Error Analysis of Students Working about Word Problem of Linear Program with NEA Procedure. *Journal of Physics: Conference Series*, 855(1). <https://doi.org/10.1088/1742-6596/855/1/012043>.
- Sari, D. E. (2018). Pendidikan literasi keuangan melalui program kemitraan dengan bank untuk mengurangi perilaku konsumtif pada mahasiswa. *Jurnal Pendidikan Dan Ilmu Sosial*, 28(1), 22–30. <https://doi.org/10.2317/jpis.v28i1.6769>.
- Sari, R. C., Ilyana, S., & Widyawati. (2013). Model Pembelajaran Literasi Keuangan Bagi Anak Usia Dini. *Google Books*, 1–83.
- Sari, Y. M., & Valentino, E. (2016). An Analysis of Students Error in Solving PISA 2012 and Its Scaffolding. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, 1(2), 90–98. <https://doi.org/10.23917/jramathedu.v1i2.3380>.
- Sopannah, A., & et al. (2020). *Bunga Rampai Akuntansi Publik: Isu Kontemporer Akuntansi Publik*. Unitomo Press.
- Sutama, S., Sofia, S., & Novitasari, M. (2019). Analisis Kemampuan Penyelesaian Soal Matematika Berorientasi PISA Dalam Konten Perubahan dan Hubungan Pada Siswa SMP. *Jurnal VARIDIKA*, 31(2), 29–36. <https://doi.org/10.23917/varidika.v31i2.10216>.



White, A. L. (2010). Numeracy, Literacy And Newman's Error Analysis. *Journal of Science and Mathematics Education in Southeast Asia*, 33(2), 129-148.  
<https://eric.ed.gov/?id=EJ970194>.

Wijayanti, I. K., & Retnawati, H. (2020). Analisis kesulitan siswa dalam memecahkan soal literasi keuangan. *Jurnal Ekonomi & Pendidikan*, 17(1), 20-33.  
<https://doi.org/10.21831/jep.v17i1.29220>.