# Analysis of Student Learning Obstacle in Hybrid Learning for Fraction Division Operations during the Covid-19 Pandemic

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**Abstract**

This aims to study to analyze the learning obstacle experienced by students in Hybrid learning for Fraction Division Operations. The research was conducted during the Covid-19 Pandemic, with the research location at a State Elementary School in Bandung. The research method used is a hermeneutic phenomenological study. The subjects in this study amounted to 27 students of class V, with the division of 10 people learning offline and 17 people online through the Zoom application. Data were collected from the final evaluation of students, teaching observations, student interviews, teachers, and parents. Analysis of the findings shows that students in offline and online learning experience three types of learning obstacles: ontogenic obstacles (psychological, instrumental, conceptual), epistemological obstacles, and didactical obstacles. Factors causing learning obstacles experienced by students are a)—lack of motivation and self-confidence in participating in learning; b). Difficulty in understanding the activities during the learning process and the technique of working on the final evaluation questions; c). The limitations of the prerequisite abilities possessed by students in the material to be taught; d). Limited use of context in learning; e). The flow of the material presented is not by the continuity of students' thinking, and the didactic intervention is less relevant. Alternative solutions are designing learning that can optimize student activities by predicting student responses and anticipating both offline and online. Provide learning recordings as reflection material for teachers, students, and parents.

**Keywords**: COVID-19 pandemic, learning obstacles, hybrid learning, fraction division

## Introduction

The Covid-19 pandemic has an impact on all aspects of life, one of which is education. Education Policy in the implementation of learning which was originally a face-to-face learning process has turned into distance-learning or online forms from home. In the 2021/2022 school year, especially

at the elementary school level, learning which was originally carried out online from home gradually began to be introduced using the concept of face-to-face learning on a limited basis with the implementation of strict health protocols. The concept of face-to-face learning is limited, of course, not without problems in its implementation. These problems are the readiness of the teacher in providing learning materials to students. This is due to the habits and ways of learning experienced by some students during the distance learning process from home. Students are accustomed to receiving learning information from the teacher through the WhatsApp Group application. The way some students learn is done at home without any assistance from their parents. This causes students to experience obstacles in learning, especially in terms of understanding the learning material and difficulties in carrying out learning tasks given by the teacher. The difficulty of students is added to that students are required to take lessons in a higher class one level with higher material. The initial cause of the problem was the void of learning interactions experienced by students because for approximately two years students studied at home and had little direct interaction with teachers in obtaining learning materials.

This finding was also obtained based on the results of a preliminary study conducted during the learning of fraction division arithmetic operations in fifth-grade elementary school when the teacher applied hybrid learning. This learning concept allows students who study directly in class and students who study at home to study simultaneously at one time (Ariawan&Divayana, 2020; Zein et al., 2019). Some students have difficulty understanding the concepts of the material being studied, especially students' understanding of the concept of fractions as a prerequisite for fractional division arithmetic operations.

Mastery of fraction material for elementary school students is very important because fraction material is the basis for learning Algebra (Benbow, 2008; Siegler et al., 2011; Booth & Newton, 2012; Pearn& Stephens, 2016; Lemonidis &Kaiafa, 2019; Stelzer et al., 2019). At a higher level of education, fractional material is a prerequisite that students must master in the context of everyday problems and learn advanced mathematical concepts (Siegler et al., 2011; Booth & Newton, 2012; Siegler et al., 2013;Gabriel et al., 2013; Resnick et al., 2016; Eichhorn, 2018; Namkung et al., n.d.; Alkhateeb, 2019). The causes of students' difficulties in studying fractional arithmetic operations are students' lack of understanding of the basic concepts of fractions, errors in the application of fractions in solving fractions problems, carelessness in understanding the language of questions, lack of understanding of prerequisite material, and errors in computing or calculating processes (Aksu, 1997; Gabriel et al., 2013; Bentley &Bossé, 2018; Mukwambo et al., 2018; Kor et al., 2018; Stelzer et al., 2019).

Based on the results of the analysis of the preliminary study, data information was obtained that the learning obstacles experienced by students were in the form of didactical and epistemological when studying fractional arithmetic operations, especially in the division in the form of story questions. The didactical obstacle found in the preliminary study is the obstacle that occurs due to the inaccuracy of the selection of teaching materials or learning designs prepared by the teacher. Meanwhile, the epistemological obstacle caused some difficulties in understanding the meaning of the questions in the questions. This is due to the limited understanding of students in understanding the context of certain problems (Suryadi, 2011). These problems make researchers interested in studying more deeply about the types and factors that cause students to experience learning barriers in hybrid learning of fraction division arithmetic operations in grade V elementary school.

**Method**

This study uses a qualitative research approach with a case study method (Creswell & Creswell, 2018). Qualitative research investigates naturally occurring events. The data processing instrument used in this study was the evaluation data of student learning outcomes when working on the matter of fraction division arithmetic operations, interview instruments for students, teachers, and parents.The subjects in this study amounted to 27 students of class V, with the division of 10 people learning offline and 17 people online through the Zoom application. Interviews were conducted with teachers and parents of students to obtain data on students' understanding of the concept of fraction division arithmetic operations and students' learning experiences in studying fraction division arithmetic operations in fifth-grade elementary school. The interview instrument was developed concerning the needs of researchers related to meaning, way of thinking, implementation, and obstacles in teaching fraction division material in elementary school with hybrid learning.

Analysis of the data used in this study using a qualitative analysis model (Miles & Huberman, 1994). The analysis phase is data reduction, data display, data verification, and concluding. Each data that has been collected from the field is written in a detailed form and forms a daily report. Considering that the daily reports are numerous and varied, therefore on the collected data, data reduction is carried out, which is done by making abstractions. Data abstraction is a summary of research data, then selected and focused on things that are important and related to the factors causing learning barriers experienced by students in the material for arithmetic division of fractions in elementary school.

**Findings**

**Types of Learning Obstacles Experienced by Students in Learning Operational Materials Counting Fractions.**

In this study, it was still found that students experienced psychological barriers in the form of student learning unpreparedness during the initial learning activities. Psychological barriers are characterized by the attitude of students who are less interested, not enthusiastic, less responsive to learning activities, less motivated, and not enthusiastic in participating in learning. Students also experience obstacles in focusing on the initial problems given by the teacher during apperception activities. These obstacles are experienced by students when they enter the material for calculating fraction division operations.

The problems experienced by students are related to understanding and mastering the prerequisite material that has been studied. In addition, some students still did not memorize the multiplication and division of natural numbers. During the implementation of learning on fractions, it was found that some students still did not understand the concept of fractions including understanding, symbols, types of fractions, equivalent fractions, simplifying fractions, and arithmetic operations of addition, subtraction, and multiplication of fractions. These findings are also reinforced by the results of interviews conducted directly with students. From the interview, it was obtained that students were not accustomed to being given a problem stimulus before learning began. This has an impact on the psychological aspects of students which causes low motivation and interest in the fraction division arithmetic operation material.

The finding of the second obstacle is instrumental which comes from students' unpreparedness related to key technical matters of a learning process that can be revealed, for example through responses and errors in the student's completion process (Balacheff et al., 2006; Suryadi, 2011). The instrumental obstacles found were in the early learning activities, students did not get clear and coherent instructions for the learning steps that students would take. The impact of the absence of clear and coherent delivery is the inability of students to follow situations that should occur in the learning process.

The lack of information related to the delivery of learning steps and task instructions that must be carried out by students. Causing students to lack understanding of technical learning, understanding of the material is lacking, including having difficulty in working on assignments. This happened because learning was carried out online through the Google Classroom application and the use of WhatsApp Group. Technical learning is done by providing material in the form of pdf files or video links (from YouTube or teacher creations). Then students work on assignments independently and without any explanation and follow-up both virtual and face-to-face. In addition, there is no

emotional bond between students and teachers, causing the communication related to be less well established. This is because the stimulus given by the teacher is not responded to by students, so learning becomes less conducive and not directed.

The third obstacle is conceptual, in this research it is characterized by students still having difficulty in carrying out the solution method using a number line approach and drawings or flat shapes. The difficulty is based on the findings from the interviews conducted. Students cannot represent fractions or fractional arithmetic operations in the form of number lines and pictures or flat shapes.

Furthermore, epistemological obstacles (epistemological obstacles), learning barriers are characterized by limited mastery of concepts in learning a new concept (Balacheff et al., 2006); (Suryadi, 2011). In this study, the epistemological obstacle found was the limited context that students had when solving problems in the fraction division arithmetic operation material. This obstacle occurs due to the lack of student involvement during the process of finding concepts, procedures, and problem-solving strategies in learning and previous student learning experiences, students are only introduced to how to solve multiplication forms and pictures are only an introduction. These findings are based on the material on the concept of fractional division arithmetic operations in the learning implementation plan (RPP), which only contains the definition of arithmetic operations, the definition of fractions, and the types of fractions. There is no specific discussion of the concept of the arithmetic division of fractions. Meanwhile, in the learning process carried out, the concept of fraction division arithmetic operations was introduced in two ways or problem-solving strategies. The first strategy is the flat-area approach, using only the shaded rectangular images. So that when students are assigned to solve the problem of calculating the division of fractions whose object shapes are circles such as pizza and triangles such as onigiri, they have difficulty in dividing and determining which parts are shaded in the circle and triangle images.

The second strategy is the multiplication approach. The solution with this strategy is to change the form of the fraction division arithmetic operation into a multiplication calculation operation on fractions, the position of the numerator and denominator of the fractional divisor is reversed. As can be seen in solving the following fraction division problem, an example problem is: The result of $\frac{1}{2} : \frac{1}{3} = \cdots$how to do it $\frac{1}{2} : \frac{1}{3} = \cdots \rightarrow \frac{1}{2} x \frac{3}{1} = \frac{1 \, x \, 3}{2 \, x \, 1} = \frac{3}{2}$ or $1\frac{1}{2}$.

Students are immediately given the technical and how to do it without giving the underlying concept. So that students tend to be less thorough or forget when given a question or other problem, they immediately work by changing the operation of dividing fractions into a multiplication of fractions. Next, students multiply the numerator by the numerator and the denominator by the denominator for the divisor.

Next, the didactical obstacle is the student learning barrier caused by the didactic system, such as the sequence and/or stages of the curriculum, including teacher intervention in presenting learning material in class (Suryadi, 2011). There is a discrepancy between the intervention and learning activities on the concept or material, learning objectives, and student characteristics. This finding is based on the design of teacher and student activities in the learning that has been prepared and the learning process that has been implemented.

The learning steps in the lesson plan, especially the core part, contain and describe the didactic design, namely when learning the use of folded and shaded paper media cannot help students understand the concept of fraction division arithmetic operations. Students have difficulty in determining the fractional value of the folded and shaded part of the paper. The shift in the use of learning media by the teacher from folding paper to wide-flat image illustrations has not encouraged the abstraction process. The learning step was initially carried out by the teacher to facilitate students' thinking from real situations to abstract ones. Students have difficulty making illustrations that show the form of fractions, for example, $\frac{1}{2}$ or working on fractional division operations with a flat-wide approach.

The lack of experience and involvement of students during the process of finding techniques or ways of solving problems, causes students to find it difficult to find and find other alternatives in answering the problem of calculating division operations on fractions. Another impact that causes students to have difficulty when asked to solve problems with more than one way of solving them. Fractional division arithmetic operations can be done in more than one way, for example, in addition to multiplication, you can also use a number line, the area drawing approach, and the problem-solving approach.

**Factors Causing the Occurrence of Learning Obstacles Experienced by Students in Learning Operational Materials Counting Fractions.**

The findings in this study there are three types of learning obstacles, namely ontogenic, epistemological and didactical. The factors that cause these obstacles, such as the ontogenic obstacle, are caused by three aspects, namely psychological, instrumental, and conceptual. The first aspect is student psychology, such as students' low motivation and interest in the material being studied, namely fractional division arithmetic operations. This finding was obtained based on the results of interviews with 10 students, there were 7 students who were less interested in participating in the mathematics learning process, especially in the material for arithmetic division operations on fractions. The reasons for students are because the material is difficult to understand, the material is too much, the material studied is related to the previous material, must memorize

formulas, do assignments in a certain way, must be careful in answering questions, questions and assignments given are many and difficult, sometimes the assignments are different. of the material provided in the learning.

The causal factor for the second aspect is instrumental, namely, the lesson plans have not described the conceptual level of students, such as the material is not arranged in a coherent manner from the prerequisite material or students' initial understanding of the material to be taught, namely fraction division arithmetic operations. The media used in learning activities does not facilitate student activities in understanding the material. The steps of learning activities do not involve students, because students are not given the freedom to find and determine how to solve problems in fractional division arithmetic operations. The questions given at the end of the lesson are less varied, so they do not measure the level of students' thinking and problem-solving abilities.

Factors causing the third obstacle are conceptual in nature, namely the lesson plans that are made less in accordance with the conceptual level or the demands of thinking and student conditions seen from previous experience. The material provided directly focuses on the arithmetic division of fractions, without being associated with the material or previous student learning experiences. In addition, when learning takes place, the material is given to students only focuses on what is in the textbook. Students are not introduced to and involved in finding and finding various alternative ways of completing fractional division arithmetic operations such as using number lines, drawings or areas of flat shapes and multiplication. Because there is no conceptual challenge causes low thinking demands. Students feel bored when following the learning process. The consequences of learning outcomes that are not optimal on the material for calculating division operations on fractions.

The next contributing factor is the epistemological obstacle caused by the limited context that students have when the concept of fraction division arithmetic operations is studied. Students are given directly how to solve fractional division arithmetic operations through a multiplication approach without involving students in the search and find process. Students are immediately given how to change the fraction division operation into a fraction multiplication operation by noting that it reverses the position of the numerator and denominator in the divisor fraction. This process does not help students' difficulties in solving fractional division arithmetic operations problems through the multiplication approach, because in practice students immediately change division into multiplication without being followed by reversing the position of the divisor fraction.

This is based on the findings that during the learning process the concept of fractional division arithmetic operations directly discussed two ways of solving them, namely (1) the area of a flat shape approach, students were only introduced to rectangular images. As a result, students find it

difficult when faced with fractional division arithmetic operations whose solutions require students to describe the area of other flat shapes such as circles, triangles, trapezoids, parallelograms, and kites; (2) fraction multiplication approach. Based on the results of the analysis of the learning practice video, students were immediately given classical examples in front of the class, how to solve them in the form of mathematical sentences, namely by changing the form of division to multiplication with notes on the fraction of the divisor behind the position of the numerator and denominator. For example, in solving the following problem: The result of $\frac{1}{2} : \frac{1}{4}$=⋯, the solution accepted by students is as follows: (1). The problem is a form of arithmetic operation for dividing ordinary fractions by ordinary fractions; (2). Rewrite the division calculation operation like $\frac{1}{2} : \frac{1}{4} =\cdots$ and then convert it into multiplication form, with a note that the divisor is behind the position of the numerator and denominator or $\frac{1}{2}\ x\ \frac{4}{1} =\cdots$; (3). Then immediately work with the numerator times the numerator and the denominator times the denominator. or $\frac{1 \text{ x } 4}{2 \text{ x } 1} = \frac{4}{2}$so immediately simplify the result, which is 2.

Based on the solution method that students received above, there are several things that need to be discussed, namely students do not know the process of changing the divisor fraction if it is changed from a division calculation operation to a multiplication operation, including the positions of the numerator and denominator being reversed. This causes students to sometimes forget to solve fractional division arithmetic operations, immediately changing the arithmetic operations. For example, $\frac{1}{2} : \frac{1}{4} = \frac{1}{2}\ x \frac{1}{4}$. Students' difficulties are caused by limited understanding of the material for arithmetic division of fractions due to the lack of student involvement in the discovery of concepts, procedures and problem-solving strategies.

The factor causing the didactical obstacle is the learning design designed and used that is not in accordance with the level of thinking and learning styles of students. The flow of material presented is not in accordance with the continuity of students' thinking, the use of limited contexts, and didactic interventions that are less relevant, so that learning is not memorable and less meaningful for students. The findings were obtained based on the lesson plans that were made and the implementation of the learning that had been carried out. In the lesson plans, students' apperception activities only obtained information about the previous material, namely about multiplication of fractions, without any questions and answers or follow-up activities to determine students' initial understanding. The learning objectives that are made do not explore the potential of students' thinking. The learning material has not focused on the arithmetic division of fractions. The learning

media used in the form of folding paper does not facilitate students' understanding of the material for arithmetic division operations on fractions.

The learning steps do not provide a learning experience for students and do not explore students' thinking processes. The instrument for the assessment of the fractional division arithmetic operation given is less varied, so it does not measure the level of students' thinking skills in solving problems. This causes a discrepancy in the student learning flow with the learning flow validated by the teacher. So that it has an impact on the discrepancy between student activities in the lesson plans and student activities in the learning carried out. As in the learning objectives in the lesson plans, the practical activity of manipulating folding paper is expected to allow students to have the ability to explain the concept of dividing fractions. However, in practice, students have difficulty in using the media to explain the concept of dividing fractions. The difficulty of students is because the instructions given are not detailed and unclear. Another reason is that assignments are carried out individually without being accompanied by Student Worksheets (LKS). To overcome this, scaffolding was given by assigning students to fold and shade the folded paper in the fractional part according to the problem, but in practice, students were still confused in folding and shading.

The next activity reassigned students to draw folded and shaded paper in notebooks and then use them to work on arithmetic division problems on fractions using a rectangular surface area approach. In addition, in the learning process, it was also found that when delivering the completion strategy through the multiplication approach, the method was immediately given without the process of searching and finding the underlying concept. So that students have difficulty, due to limited understanding in answering the problem of calculating division operations on fractions through the multiplication approach. Other examples such as in working on problems related to the arithmetic division of natural numbers with ordinary fractions, as well as other arithmetic division operations.

The following are the findings of the learning obstacle that students experienced, based on the results of the analysis of the incorrect workmanship of the 5 final evaluation questions of fraction division learning and student interview answers.

Question number 1, which is $\frac{2}{3} : \frac{1}{4}$ in the form of a picture is …., here are the students' answers:

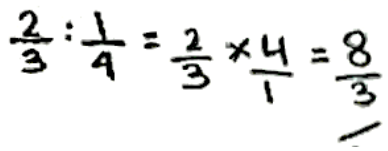


Figure 1. The answer to question number 1 is wrong (B.1.1)

Students answer question number 1 directly in the form of numbers, the reason is that students are less careful in reading the question and it is easier to work with multiplication. If you look at the answers in Figure 1, students experience an instrumental ontogenic obstacle, because students have correctly answered algorithmically, but they are not in accordance with the instructions on the question. In addition, students experience an epistemological obstacle, due to the limited context during learning. Students only get a glimpse of knowledge and experience on how to solve using the broad-plane approach.

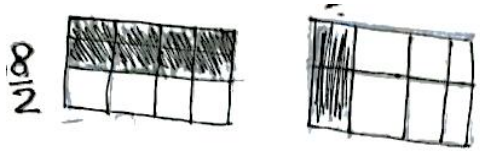


Figure 2. The answer to question number 1 is wrong (B.1.2)

In Figure 2. above, students answer by drawing $\frac{2}{3}$by making a box, then outline 3 then shaded 2, and drawing $\frac{1}{4}$by making a box lined 4 in shaded 1. Next, picture $\frac{2}{3}$is divided again into 4 and divides $\frac{1}{4}$becomes 2 which should be 3. So, the final result is wrong. The reason students explain how to work with pictures is only for a moment, so they don't understand. If you look at the answers in Figure 2, students experience an epistemological obstacle, because at the time of learning they only get a glimpse of knowledge and experience about how to solve using a flat-wide approach.

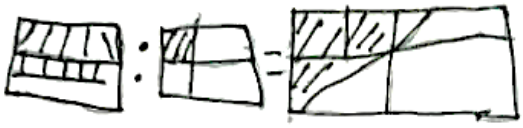

Figure 3. The answer to question number 1 is wrong (B.1.3)

Based on Figure 3. above, students answered $\frac{2}{3}$by drawing a rectangle divided by 3 horizontally, 2 parts are shaded. Then draw a rectangle divided by 4 and shaded by 1 to represent $\frac{1}{4}$. Next, draw the answer in the form of a rectangle that has been divided and shaded. However, the image does not produce the correct answer. The reason is that when students learn how to work through pictures, the time is too short and the explanation is too fast, so they are still confused about completing the pictures of the results of the division. If you look at the answers in Figure 3., students experience an epistemological obstacle, because at the time of learning they only gain knowledge and experience immediately about how to solve using a flat-wide approach. In addition, students also experienced

didactical obstacles, due to the explanation related to the material given too quickly, so students could not follow and understand the material presented.

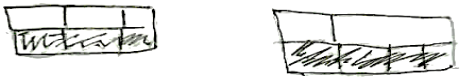

Figure 4. The answer to question number 1 is wrong (B.1.4)

Based on Figure 4. above, students do not understand how to work in the form of pictures. The reason for the students during the learning process is that the time for delivering the solution through pictures is only for a short time, besides that the explanation is also too fast and less detailed so that students experience confusion because they do not understand it has continued to other ways. If you look at the answers in Figure 4., students experience a conceptual ontogenic obstacle because students feel the material is too difficult and difficult to understand. Students also experience didactical obstacles, due to the explanation regarding the material being given too quickly, so students cannot follow and understand the material presented.

Figure 5. The answer to question number 1 is wrong (B.1.5)

Based on Figure 5. above, students answered $\frac{2}{3}$ made a square then lined 2 and shaded 2, for $\frac{1}{4}$ the same only shaded 1. Then drew the result by combining the shaded parts. The students' reason is that if the square is shaded 1 it means 1 per, if it is shaded 2 it means 2 per. If you look at the answers in Figure 5, students experience a conceptual ontogenic obstacle because students feel the material is too difficult and difficult to understand, so students only answer according to their understanding.

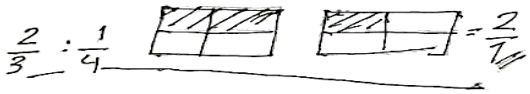

Figure 6. The answer to question number 1 is wrong (B.1.7)

Based on Figure 6. above, students answered making a square then shaded 2 to become $\frac{2}{3}$and shaded 1 to $\frac{1}{4}$, then calculated the shaded to $\frac{2}{1}$. Students do not understand how to work using the shaded flat figure. The reason is that they still don't understand how to write fractions in the form of pictures and are too quick to explain the material. If you look at the answers in Figure 6., students experience a conceptual ontogenic obstacle because students feel the material is too difficult and

difficult to understand, so students only answer according to their understanding. In addition, students also experienced didactical obstacles, due to the explanation regarding the material being given too quickly, so students could not follow and understand the material presented.

Question number 2, which is the result of $\frac{2}{5} : \frac{1}{2}$is ...., here are the students' answers:

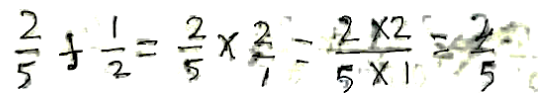

Figure 7. The answer to question number 2 is wrong (B.2.1)

Based on Figure 7 above, students immediately answered and worked on the problem by multiplying, but due to lack of accuracy, they forgot to change the position of the numerator and denominator on the divisor fraction, so students deleted the x-type result of their work. Then rewrite the problem, but because it's in a hurry so write down the division operation into addition. Next, work on the problem by multiplying and changing the position of the numerator and denominator in the divisor fraction, but due to lack of concentration, the result of multiplying the numerator with the numerator is wrong. The reason students want to finish quickly and feel they can. If you look at the answers in Figure 7, students experience a psychological ontogenic obstacle, because students feel anxious, so they are less thorough, rush in answering questions, and think they are easy to do.

Question number 3, which is the result of $3 : \frac{1}{4}$is ...., here are the students' answers:

Figure 8. The answer to question number 3 is wrong (B.3.1)

Based on Figure 8. above, students assume that $3 : \frac{1}{4}$is a mixed number $3\frac{1}{4}$and ignore the divisor symbol (:). If you look at the answers in Figure 8, students experience an epistemological obstacle, due to the limited context and student learning experience, so that students work on the problem according to what they think, namely changing mixed fractions into ordinary fractions.

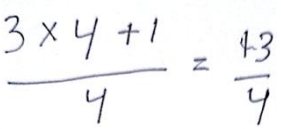

Figure 9. The answer to question number 3 is wrong (B.3.2)

Based on Figure 9. above, students assume that $3 : \frac{1}{4}$is a mixed number, not a division operation. If you look at the answers in Figure 9, students experience an epistemological obstacle, due to the

limited context and student learning experience, so students work on the problem according to what they think, namely changing mixed fractions into ordinary fractions.

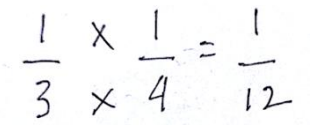


Figure 10. The answer to question number 3 is wrong (B.3.3)

Based on Figure 10. above, students answered 3 to $\frac{1}{3}$ because if you multiply it you must add 1 above it, otherwise, it cannot be added to it. If you look at the answers in Figure 10, students experience a didactical obstacle, because the explanation regarding the material given is too fast, so students make their own conclusions according to their understanding (a misconception occurs).

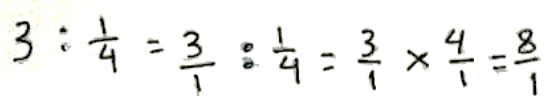


Figure 11. The answer to question number 3 is wrong (B.3.4)

Based on Figure 11. above, the error in multiplying 3 x 4 that 12 students should have answered 8. If you look at the answers in Figure 11, students experience an ontogenic conceptual obstacle because students still have difficulty in multiplying numbers.

Question number 4, which is the result of $\frac{5}{7} : 2$ is ...., here are the students' answers:

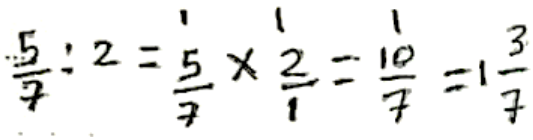


Figure 12. The answer to question number 4 is wrong (B.4.1)

Based on Figure 12. above, students are in a hurry to solve the arithmetic division problem by directly changing the arithmetic operation to multiplication,$\frac{5}{7} : 2 = \frac{5}{7} \; x \; \frac{2}{1}$. After the interview, the students realized their lack of accuracy which should be $\frac{5}{7} : 2 = \frac{5}{7} \; x \; \frac{2}{1} = \frac{5}{14}$. If you look at the answers in Figure 12, students experience a didactical obstacle, because the explanation regarding the fraction distribution material is given directly without the concept that precedes it, so students often forget the completion steps that should be done.

Question number 5 is Haryati buying $7\frac{1}{4}$kg of oranges. The oranges were distributed equally to 5 children. Each child receives as many oranges as ...., the following are the students' answers:

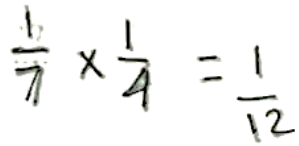

Figure 13. The answer to question number 5 is wrong (B.5.1)

Based on Figure 13. above, students do not understand how to work on questions, from the answers there are errors in multiplying 7 x 4. The reason students do not understand the meaning of the questions and how to solve story problems. If you look at the answers in Figure 13, students experience an epistemological obstacle, due to the limited context and learning experience, because students are not used to being given problems or questions in the form of story questions. Students also experience a didactical obstacle, because the material for the division of story questions is given directly the formula and steps without going through the process or stages from concrete to abstract, so it is difficult to write story questions into mathematical sentences. Students also experience the conceptual Ontogenic obstacle because students still have difficulty in multiplying numbers

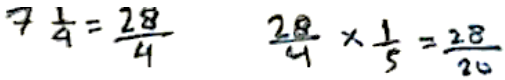

Figure 14. The answer to question number 5 is wrong (B.5.2)

In Figure 14, the reason students change mixed fractions into ordinary fractions is to make it easier to work with. Students change the natural number 5 into an ordinary fraction $\frac{1}{5}$in multiplication students answer 1 comes from 1 divided by 1 and do not know why it has to be $\frac{1}{5}$. In addition, students missed 1 step in converting mixed fractions $7\frac{1}{4}$into a common fraction, after multiplying the natural number 7 by the denominator 4, the numerator should be added to 1 or it becomes $\frac{29}{4}$instead of $\frac{28}{4}$. The students' reason was because they forgot, so they missed it. If you look at the answers in Figure 14, students experience the conceptual Ontogenic obstacle, because students do not fully understand how to solve it through the form of multiplication in answering story questions.

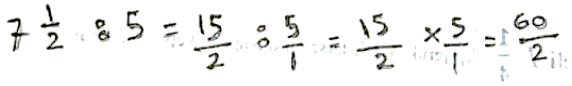

Figure 15. The answer to question number 5 is wrong (B.5.3)

Based on Figure 15. above, students who are less careful should be $7\frac{1}{4}$, students write $7\frac{1}{2}$. If you look at the answers in Figure 15, students experience Psychological Ontogenic obstacles, because students feel anxious, so they are in a hurry and are not careful in answering questions.

The results of the analysis of students' incorrect answers and based on the results of interviews still found students who had learning difficulties or barriers such as: (1). Ontogenic obstacle instrumental, students have correctly answered algorithmically, but not in accordance with the instructions on the question; (2). Ontogenic obstacle Psychological, students feel anxious, so they are less thorough, rush in answering questions, and think they are easy to do; (3). Ontogenic conceptual obstacle, students feel the material is too difficult and difficult to understand. So that students answer according to their understanding. Students still have difficulty in multiplying numbers and understanding how to solve them through multiplication when answering story form questions. There are still students who have difficulty showing the numerator and denominator in fractions.

The next learning obstacle experienced by students is the epistemological obstacle, due to the limited context during learning. Students only get a glimpse of knowledge and experience about how to solve using a flat-wide approach. The limited context and student learning experience, so students work on the problem according to what students think, namely changing mixed fractions into ordinary fractions. The next epistemological barrier found was that students were not accustomed to being given problems or questions in the form of stories.

Students also experience learning barriers in the form of didactical obstacles, due to the explanation of the learning material given too quickly. So that students have difficulty in understanding the material presented by the teacher. At the final activity stage, the absence of concluding learning activities causes students to make their own conclusions according to their understanding (allowing students to have misconceptions). In addition, explanations related to fractional division material are given directly without the concept that precedes it, so students often forget the completion steps that should be done.

Another reason is that the material for the division of story questions is given directly the formula and steps without going through the process or stages from the concret to the abstract, so that it is difficult to represent the language of the problem into a mathematical sentence. For example, students have to imagine how many oranges weigh $7\frac{1}{4}$kg because the size or size of each orange is actually different. So, when there is a hint on the question "$7\frac{1}{4}$kg oranges are distributed to 5 people, each child gets the same number of oranges. Students have difficulty because they assume the answer is the number of oranges, not the weight of oranges.

The following describes the analysis of the correct student work results from 5 final evaluation questions of fraction division learning and student interview answers. Question number 1, which is $\frac{2}{3} : \frac{1}{4}$in the form of a picture is …., here are the students' answers:

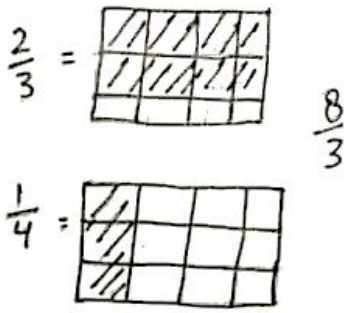


Figure 16. The correct answer to question number 1 (B.1.1)

Based on Figure 16 above, students answered $\frac{2}{3}$in the form of a rectangular image then divided it by three to the side (horizontally) and shaded in half, then drew another $\frac{1}{4}$in the form of a rectangle divided by four and shading one down (vertical). The rectangle that represents $\frac{2}{3}$is further divided by four downwards so that there are 8 squares in the shaded area, while the rectangle that represents $\frac{1}{4}$is further divided by three to the side so that there are 3 shaded ones. Next, count and write down the shaded part so that you get The rectangle that represents $\frac{2}{3}$has 8 parts and the rectangle that says $\frac{1}{4}$has 3 parts is shaded so the answer is $\frac{8}{3}$. If you look at the answers in Figure 16, the students answered like that with the reason that when learning was exemplified the way it was done was like that.

Question number 2, which is the result of $\frac{2}{5} : \frac{1}{2}$is ...., here are the students' answers:

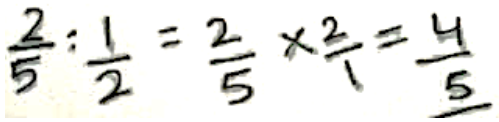


Figure 17. The correct answer to question number 2 (B.2.1)

Based on Figure 17. above, students answered by changing the arithmetic operation from division to multiplication $\frac{2}{5} : \frac{1}{2} \rightarrow \frac{2}{5} \; x \; \frac{2}{1}$. By turning the denominator into the numerator, the numerator becomes the denominator of the divisor. Then multiply the numerator by the numerator and the denominator by the denominator, so that the result is $\frac{4}{5}$. If you look at the answers in Figure 17, students solve problems using the multiplication method with the reason that the multiplication

method that he understands the most is because it is easy to just change the division into multiplication and reverse the position of the numerator with the denominator in the second fraction.

Question number 3, which is the result of $3\frac{1}{4}$is ...., here are the students' answers:

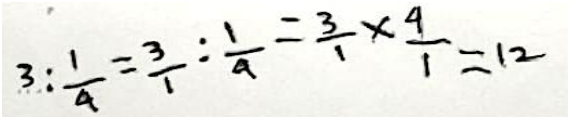


Figure 18. The correct answer to question number 3 (B.3.1)

Based on Figure 18. above, students answered using multiplication by changing the number 3 to $\frac{3}{1}$on the grounds that 3 if an ordinary fraction is made, it means one by one or the denominator is 1 according to the explanation he received at the time of learning. Then $\frac{1}{4}$is reversed to $\frac{4}{1}$. However, when asked why the students answered they did not know why it had to be reversed. Next, students write down the result 12 with the reason that even though the actual result is $\frac{12}{1}$the same as the number 3, so it doesn't have to be written one by one.

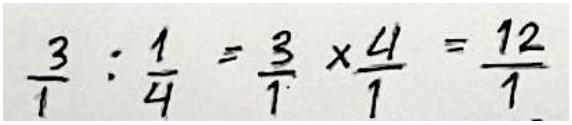


Figure 19. The correct answer to question number 3 (B.3.2)

Based on Figure 19 above, students answered using multiplication by converting the number 3 to the fraction $\frac{3}{1}$then changing the division operation to multiplication and reversing the position of the numerator with the denominator in the second fraction. $\frac{3}{1} : \frac{1}{4} \rightarrow \frac{3}{1} \; x \frac{4}{1} = \frac{12}{1}$. If you look at the answers in Figure 19, students answer that way with the reasons according to what they received at the time of learning, namely the number 3 if it is converted into a fraction, meaning that the denominator is 1 or one by one. Then if the division is changed to multiplication of the second fraction the position of the numerator with the denominator is reversed. Then it is done by multiplying the numerator by the numerator and the denominator by the denominator, so that the result is $\frac{12}{1}$.

Question number 4, which is the result of $\frac{5}{7} : 2$ is ...., here are the students' answers:

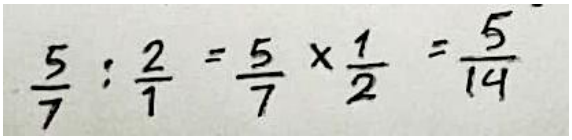


Figure 20. The correct answer to question number 4 (B.4.1)

Based on Figure 20 above, students answered using multiplication as follows $\frac{5}{7} : \frac{2}{1} \rightarrow \frac{5}{7} \; x \frac{1}{2} = \frac{5}{14}$. By rewriting $\frac{5}{7}$then writing the number 2 into $\frac{2}{1}$then changing the arithmetic operation to multiplying with the second fraction the position of the numerator with the denominator reversed and then multiplying the numerator with the numerator and the denominator with the denominator, so that the result $\frac{5}{14}$cannot be simplified because the numerator is smaller than the denominator.

If you look at the answers in Figure 20, students answer that way with the reasons according to what they received at the time of learning, namely the number 2 if it is converted into a fraction, meaning that the denominator is 1 or one by one. Then if the division is changed to the multiplication of the second fraction the position of the numerator with the denominator is reversed. Then it is done by multiplying the numerator by the numerator and the denominator by the denominator, so that the result is $\frac{5}{14}$.

Question number 5 is Haryati buying $7\frac{1}{4}$kg of oranges. The oranges were distributed equally to 5 children. Each child receives as many oranges as ...., the following are the students' answers:

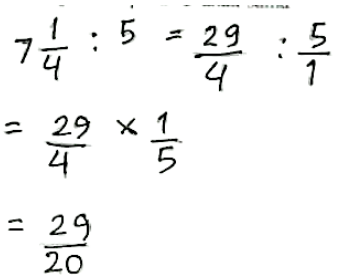


Figure 21. The correct answer to question number 5 (B.5.1)

Based on Figure 21 above, students answered using the multiplication method as follows: Mixed fractions were first changed to ordinary fractions to make it easier to work. .$7\frac{1}{4}$ : 5$\rightarrow 7\frac{1}{4} \rightarrow 7 \; x \; 4 = 28$ then + 1 per 4 so that it becomes $\frac{29}{4}$then 5 becomes $\frac{5}{1}$because it is converted to an ordinary fraction meaning by one or the denominator 1. So $\frac{29}{4} : \frac{5}{1} \rightarrow \frac{29}{4} \; x \frac{1}{5} = \frac{29}{20}$.

If you look at the answers in Figure 21, students answer that way with the reasons according to what they received at the time of learning because the form of the question is a mixed fraction, so it must be changed first into ordinary fractions to make it easier for students to work on the questions. Then the number 5 because it is a natural number, then it is first converted into a fraction. Because

the division operation is changed to a multiplication operation, the second fraction of the numerator with the denominator is reversed.

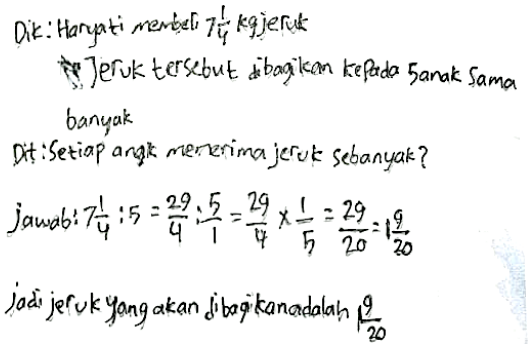


Figure 22. The correct answer to question number 5 (B.5.2)

Based on Figure 22 above, students answered using a problem-solving approach to story questions. By looking for what is known first, then asked and answered. $\frac{29}{4}$of the mixed number $7\frac{1}{4}$. The result of $\frac{29}{20}$is simplified to $1\frac{9}{20}$, the way 29 is divided by 20 to $1\frac{9}{20}$. If it is observed from the answers in Figure 22, students answer in this way with the reasons according to what they received at the time of learning because the questions consist of mixed fractions, so they must be changed first to ordinary fractions so that they can be worked out by students. Then the number 5 because it is a natural number, then it is first converted into a fraction. Because the division operation is changed to a multiplication operation, the second fraction of the numerator with the denominator is reversed. Because the result of the answer is the numerator is greater than the denominator so it can be simplified.

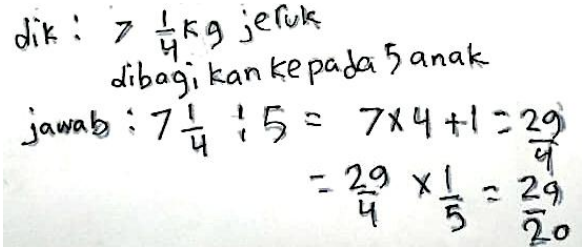


Figure 23. The correct answer to question number 5 (B.5.3)

Based on Figure 23 above, students answered using multiplication with a problem-solving approach to story questions. By writing it is known first that is $7\frac{1}{4}$kg of oranges. Distributed to 5 children. The answer is by changing the mixed fraction $7\frac{1}{4}$to an ordinary fraction such as 7 x 4 +1 = 29 the denominator is still 4. From division it is changed to multiplication so that $\frac{29}{4}\ x\frac{1}{5} = \frac{29}{20}$.

If you look at the answers in Figure 23, students answer that way with the reasons according to what they received at the time of learning because the questions consist of mixed fractions, so they must first be changed to ordinary fractions so that they can be done. Then the number 5 because it is a natural number, then it is first converted into a fraction. Because the division operation is changed to a multiplication operation, the second fraction of the numerator with the denominator is reversed.

Based on the data analysis of the answers and interviews with students, the next researcher confirmed by interviewing teachers and parents. From the results of the interviews, information was obtained that the difficulties experienced by students during learning were still found in students who did not understand the concept of multiplication which was used as the basis or prerequisite in learning the material for dividing fractions and the previous material on multiplication of fractions. Meanwhile, the results of interviews with parents related to learning and about the final evaluation of learning provided information obtained that:

In the learning process students are motivated to follow the learning process carried out by the teacher. However, there are still students who experience obstacles in understanding the material for arithmetic division operations so that they need to be guided and re-explained by parents when studying at home. Students are often reversed in working on the division operation, sometimes students do it by adding. The cause of difficulties for parents in providing guidance is that students sometimes forget what has been explained (B-AZK). Learning really motivates children to learn. Difficulty in simplifying the division of fractions. The solution provides assistance when students work on fraction division problems (B-FEB). Students have difficulty in simplifying fractions (A-ALF). The assistance provided by parents is to provide examples and then the children work on their own (B-ARB). Students do not understand the material division of fractions. Difficulty simplifying fractions (A-VIK). Difficulty when converting mixed fraction numbers into common fractions (B-ZAH). Students do not understand when learning fraction division (B-QAY). The material for dividing fractions is quite difficult for parents, the media through zooming in on the children's motivation has increased. Students have difficulty understanding the material. Assistance by example (B-FAT). If you don't understand, look on Google or YouTube (B-DIN). Students have difficulty in learning and understanding the material for dividing fractions (B-ANI), (B-ZID), (B-HAR), (B-ZAF), (B-IKH), (B-VIN).

Based on the results of interviews with students, data was obtained, the learning barrier factors for students who studied offline were feeling unprepared to learn, afraid to be asked because they could not answer, lack of student prerequisite skills (conceptual), When students did not understand the instructions and technical questions, students were embarrassed to ask to friends and afraid to ask the teacher (instrumental), students' attention is divided sometimes looking at the teacher and

sometimes seeing students who are online at home or focus on learning is divided (didactical). While students who study online are conceptually lacking in prerequisite skills, when they do not understand students have the opportunity to seek information from other sources so that the learning flow that appears is not in accordance with the activities that have been arranged. Technical and instructions are not from the teacher but from parents who accompany (instrumental), students do not focus on the learning delivered by the teacher, besides the lack of socialization between students (didactical).

The data from the interviews above can be concluded that students experience obstacles in learning, especially when understanding the material for arithmetic division operations on fractions. The difficulty of students in simplifying fractions, understanding the meaning of the problem, and determining the arithmetic operations used. Students who study offline, those who study students, really those who follow the learning are the students. When you can answer the questions correctly, you can be held accountable, because students understand. Students who study online, who take part in learning apart from students are also parents, if the student's answer is correct sometimes the answer is the result of the parent's answer, even students actually do not understand. The achievement of learning objectives for online students is sometimes false for online students because sometimes parents also learn.

**Conclusion**

The types of learning obstacles in learning the material for division arithmetic operations on fractions in class V are (1) psychological ontogenic obstacles, there are still students who have not memorized multiplication. Students have difficulty remembering the material that has been given. Do not understand the concept of fractions including understanding, symbols, types of fractions, equivalent fractions, simplifying fractions and arithmetic operations of addition, subtraction, and multiplication of fractions; (2) ontogenic obstacle instrumental, namely students do not understand the technical learning and the material provided, including difficulties in working on assignments; (3) the conceptual ontogenic obstacle, namely students have difficulty in representing fractions and fractional arithmetic operations in the form of number lines and pictures or flat shapes; (4) epistemological obstacle, namely the limited context that students have in solving fractional division arithmetic operations due to the lack of involvement in the discovery of concepts, procedures and problem solving strategies in learning as well as previous student learning experiences, students are only introduced to how to solve multiplication forms and pictures are just as introduction; and (5) didactical obstacle, namely the discrepancy between the intervention and learning activities on the concept or material, learning objectives and student characteristics.

Factors causing learning obstacles in learning fraction division arithmetic operations material in class V are: (1) psychological ontogenic obstacle, low motivation and student interest in fraction division arithmetic operations material, due to material that is difficult to understand and too much, between the material that has been studied and will be studied are interrelated, must memorize formulas, do assignments in a certain way, must be careful in answering questions, questions and assignments given are many and difficult, and sometimes assignments are different from the material given in learning; (2) ontogenic obstacle instrumental, namely learning materials for fraction division arithmetic operations are not arranged in a coherent manner starting from the prerequisite material or mastery of students' concepts of the material to be taught. The media used in learning does not facilitate student activities in understanding the material. The steps in learning activities are still focused on teacher activities. The questions given at the end of the lesson are less varied, so they do not measure the level of students' thinking skills in solving problems; (3) the conceptual ontogenic obstacle, namely the material provided directly focuses on the arithmetic division of fractions, without being associated with the previous material. Students are not introduced to and involved in finding and finding various alternative ways of completing fractional division arithmetic operations such as using number lines, drawings, or areas of flat shapes and multiplication; (4) epistemological obstacle, namely students are directly given the technical and how to do it without giving the underlying concept. Students directly work by changing the fraction division operation into a fraction multiplication operation, then multiplying the numerator by the numerator and the denominator by the denominator without reversing the position of the numerator and denominator in the divisor fraction; and (5) didactical obstacle, namely the learning design that is designed and used is not in accordance with the level of thinking and learning styles of students. The flow of the material presented is not in accordance with the continuity of students' thinking, the use of limited contexts, and didactic interventions that are less relevant.

The solution that can be done by teachers to overcome student learning barriers is that before the implementation of learning students are given the opportunity to study the material to be taught in advance by making a summary related to the material to be taught. The teacher provides opportunities for students to study the material to be taught and assigns a summary. So that students are expected to feel ready to learn, this can overcome psychological ontogenic barriers, because students feel ready to learn and have sufficient initial ability to learn the next lesson. Students have material to have discussions with their friends. Psychologically the child is ready to learn and has an atmosphere for discussion. Teachers must be able to distinguish between online and offline student response predictions. The learning media between online and offline must be the same, for example, if you practice offline, then those online also practice. Provide sufficient time for online

and offline students to present the results of their group discussion work. Reflect and follow up on learning outcomes in the form of impressions from students during online and offline learning. The didactic design designed by the teacher needs to explain online and offline activities at the same time. There needs to be a collaboration with parents to be able to ensure and accompany the online learning process for students to be able to learn independently the teacher packs online and offline learning activities as much as possible to be able to walk together withthe results of the student's final evaluation answers, offline, answers and Work steps are almost the same as those given at the time of learning, while online students for more varied answers.

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