REDUCTION SCHEME FRACTIONS OF STUDENTS IN GRADE IV SD N 02 PULUTAN

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Abstract

Identification of student think section's are very important to develop the knowledge of students. Meanwhile, the study looks at and involve mental processes when the students completed the substraction of fractions is still hard to find. This research is a qualitative descriptive study aimed to describe schemes for the fractional number of fourth grade students of Pulutan 02 Elementary School. The subjects of this study are 5 students of fourth grade students of Pulutan 02 Elementary School determined by purposive sampling. The results of this study showed that there were eleven fractions substraction scheme used student reduction, including the over substraction directly scheme, the over guessing scheme, the over addition directly scheme, the equivalent under-over substraction scheme, the over substraction-under substraction directly scheme, the under equalization-over substraction directly scheme, the over addition-under addition directly scheme, the over addition directly-lower right equalization scheme, the over addition-under substraction directly scheme, the under equalization–over addition scheme, and the over substraction directly-middle bottom equalization scheme. Other meaning and thought processes used students that is the meaning of fractions, the substraction of number process, the finding of least common multiple process, the multiplication by queue process, and the multiplication by repeated addition process.

Introduction

The level of understanding of a student is more influenced by the student's own experience in constructing knowledge or cognitive frameworks through the process, knowing it is a process not a product [5]. Santrock in [4] states that there are two processes responsible for the way children use and adapt the cognitive framework of assimilation and accommodation. Someone structuring things in mind depends on the facts or experience that it faces, so that the process of assimilation and accommodation between the child and another one is different. Differences in the process of assimilation and accommodation of each child's thought process resulted in each child in building his own knowledge also different (Piaget in [6]).

The process of formation or of construction of knowledge based on the experience of each child in accordance with the schools of constructivism (Boghossian in [2]). Schools of constructivism provide the foundation to skim built or constructed by the child based on the child's experience. Piaget in [9] define a scheme as a pattern of behavior or general measures that can be repeated or generalized through the use of the new objects.

Smithers is one of the important topics in elementary school mathematics instruction that consists of several operations, one of which is a reduction operation. In [3] states that in a matter of 186 students completed the 10 students who are changing the mixture fraction into a regular fraction first and then subtracting multiplying the numerator and denominator, and there are 13 students who convert fractions into fractions usual mix first and then equating the denominator by using the Commission. Based on the above research shows that these students have the knowledge and diversity schemes to reduced material fractions. Meanwhile, the study tried to see and involve mental processes when the students complete the subtraction of fractions is still difficult to find.

Based on the above, it will be conducted research titled "Reduction Scheme Fractions Students In grade IV SD N 02 Pulutan" in order to determine the reduction skim fractions in fourth grade of 02 Public School Pulutan. Theoretical benefits of this study was to determine the appropriate mindset students' knowledge of the students, especially scheme fractions reduction. The benefits of this study for students is to determine the reduction scheme fractions of the students so that students can develop the existing scheme. The benefits of this study for teachers is to help teachers know which students have reduction scheme, thus teachers can know the mindset which each student in solving problems related to the reduction of fractions.

Research Methodology

The study used in this research is descriptive qualitative research. In Sangadji Creswell (2010) states that qualitative research is descriptive research that seeks to describe and interpret the object as it is so that the data is expressed in the form of verbal and analyzed without the use of statistical techniques. The subjects of this study were students in fourth grade of 02 Public Elementray School Pulutan were determined by using purposive sampling, ie sampling as a data source based on the objectives and specific considerations (in [8]). This research was conducted in grade four is located at No. 11 Jalan Dipomenggolo Salatiga Telephone (0298) 324 930 Postal Code 50716 with reduced material fractions. The study was conducted in February-March 2014 in the 2nd semester of data collection technique used is the technique of

triangulation. Technique can be interpreted as the triangulation of data collection techniques using participant observation, interviews, and documentation (in [8]). The main instrument in this study is the researchers themselves, but in this study there is a supporting instrument that tests the ability of a mathematical description of the later explanation about obtaining an answer to the question above description is obtained through clinical interviews so it can be schemed reduction fractions to each student. The data obtained during the study, and then analyzed using a 4 stage is data collection, data reduction, the data display, and conclution drawing/verification.

Research Results

Results of interviews with five subjects on reduction fractions activity with the same denominator obtained several schemes that use the subject to complete the operation and meaning of the subject constructed in the same fractional reduction operation. Used scheme the subject was immediately reduced scheme over guessing, and direct addition of schemed over. Here is the meaning of the subject constructed in the same reduction fractions.

Table 1. Built meaning subjects in Reduction Fractions with the Same Fraction

No	Built Meaning	NS	SR	FK	MA	WU	Total
	Reduction Form $\frac{a}{b}-\frac{c}{b}=\blacksquare$						
1	Subtracting the numerator by the numerator then the denominator remains	√	√	√	√	√	5
	Reduction Form $\frac{a}{b}-\blacksquare=\frac{c}{b}$						
1	Subtracting the numerator is known then the result of the reduction in numbers deduction becomes the numerator, while the denominator numbers deduction remains	√	√	√	√	√	5
	Reduction Form $\blacksquare-\frac{a}{b}=\frac{c}{b}$						
1	Guessing numerator while the denominator number abated numbers remain			√			1
2	Direct summing numerator while the denominator is known abated numbers remain	√	√		√	√	4
3	Directly subtracting the known numerator while the denominator remains abated numbers	√	√	√			3

Results of interviews with five subjects on reduction surgery fractions with different denominators obtained several schemes that are used to complete the operation subjects and subjects constructed meaning in different fractional reduction operation. Used scheme the subject was under-reduction equation scheme over, scheme the direct reduction of above-under reduction, equalization scheme under direct reduction of the above, the direct reduction scheme on the lower right-equation, the direct addition of scheme top-down addition, the direct addition of scheme over equation lower right, scheme the direct addition of a top-down reduction, equalization scheme under-adding up, and scheme the direct reduction of lower-middle equation. Here is the meaning of the subject constructed in the reduction of different fractions.

Table 2. Built meaning subjects in Reduction Fractions with Different Fractions

No	Built Meaning	NS	SR	FK	MA	WU	Total
	Reduction Form $\frac{a}{b}-\frac{c}{d}=\blacksquare$						
1	Equating the denominator becomes the new denominator then divided each new denominator multiplied each denominator and numerator then subtracted into the new numerator	√	√		√	√	4
2	Subtracting the numerator by the denominator and then subtracting by numerator			√			1
	Reduction Form $\frac{a}{b}-\blacksquare=\frac{c}{d}$						
1	Equating the denominator then subtract directly numerator	√	√				2
2	Directly subtracting the numerator by numerator and denominator by the denominator			√			1
3	Equating the denominator becomes the new denominator then divided each new denominator multiplied each denominator and numerator then subtracted into the new numerator				√	√	2
	Reduction Form $\blacksquare-\frac{a}{b}=\frac{c}{d}$						
1	Adding directly numerator with the numerator by the denominator and then add directly denominator	√	√				2
2	Adding the numerator by the denominator then the new numerator equal to the denominator results in a reduction			√			1
3	Adding direct numerator known then subtracting the known direct denominator				√		1
4	Equating the denominator becomes the new denominator then divided each new denominator multiplied each denominator and the numerator is then added into the new numerator					√	1
5	Equating the denominator then subtract directly numerator	√					1
6	Directly subtracting the numerator by numerator and denominator by the subtracting direct numerator		√				1
7	Directly subtracting the numerator then the denominator equal to the denominator numbers deduction			√			1

Discussion

Based on the meaning of fractions reduction provided by the subject can be found at the top of the scheme that is used by 11 subjects when performing operations with fractions reduction of some type of problems. Scheme found when subjects perform subtraction of fractions equal subject namely direct reduction scheme over, scheme over guessing, and direct addition of schemed over. Scheme found when subjects perform a reduction operation different fractions, namely under-reduction equation skim over, scheme the direct reduction of above-under reduction, equalization scheme under direct reduction of the top, skim the direct addition of top-down addition, the direct addition of skim over-equalization bottom right, the direct addition of scheme top-down reduction, equalization scheme under-adding up, and scheme the direct reduction of lower-middle equation.

The following are the types of fractions reduction scheme with three basic components, namely originators, actions and operations, as well as the expected results.

Direct Reduction Top Scheme

Originator:
Have the same denominator need not be equated to first
Action and operation:
Subtracting the numerator with the numerator
Expected Result:
The results become numerators fractional reduction of the numerator and denominator fractions were asked in question together with the known fractional denominator

Guessing Top Scheme

Originator :
Fractional reduction of one of the unknown fragments found by trial and error and the numbers that have the same denominator need not be equated first
Action and Operation :
Looking numerator which can be reduced by a fraction the numerator of known then the result is a fraction the numerator of the existing result
Expected Results :

Results for guessing the numerator becomes the numerator and denominator fractions were asked the same fractions with denominators asked fractional known

Direct Subtracting Top Scheme
Originator :
The addition of fractional numerator is known to result in the numerator and denominator fractions were asked who had the same need not to be equated first
Action and operation :
Adding direct numerator by numerator is already known
Expected Results :
The result of the addition of the numerator becomes the numerator for the fraction in question and asked the same denominator fractions with denominators fraction of known

Equation Scheme Under-Above Reduction
Originator :
Same denominator should not be equated first
Action and operation:
Equating the denominator by finding the Highest Common Factor{HCF}, HCF then becomes the denominator for the fractions in question then the denominator of the fraction in question divides the denominator of each fraction is then multiplied by the result of the division of the numerator of each fraction then the result of multiplying the numerator is subtracted
Expected Results :
The result of the reduction of the numerator becomes the numerator for the fraction in question and asked the same denominator fractions with denominators fractions after equated

Direct Scheme Above Reduction-Under Reduction
Originator :
Denominators are not the same need not be equated with the search for the HCF
Action and Operation :
Subtracting the known fractional numerator and denominator fraction subtracting the known
Expected Results :
The result of the reduction of the numerator for a fraction the numerator be asked and reducing the denominator to the denominator of the fraction in question

Equation Scheme Under-Direct Reduction Above
Originator :
Unlike denominator should be equated first
Action and Operation :
Looking for the HCF, HCF then becomes the denominator for the fractional numerators directly asked then subtracting fractions that are known to be a fraction the numerator in question
Expected Results :
The results of the direct reduction of the numerator becomes the numerator for the fraction in question and asked the same denominator fractions with denominators fractions after equated

Direct Scheme of Subtracting Above-Subtracting Under
Originator :
Looking fractions were asked simply add the numerators directly known then added directly denominator is known
Action and operation :
Adding direct numerator known then added directly denominator is known
Expected Results :
The result of the addition of fractions numerator be asked numerator and denominator to the result of adding the denominator for the fractions in question

Direct Scheme of Subtracting Above-Equation of Bottom Right

Originator :
Asked denominators must be the same with the right fractional denominator
Action and Operation :
Add the numerators are known to be directly asked numerator then the denominator in question equate with the right fractional denominator
Expected Results :
Be the result of adding the numerator and denominator fractions were asked in question together with the right fractional denominator

Direct Scheme of Subtracting Above-Reduction Under
Originator :
Which has not been the same denominator can be directly deducted
Action and Operation :
Add the numerators are known to be directly asked then subtract numerators directly into a known denominator denominator fractions were asked
Expected Results :
The result of the addition of fractions numerator be asked numerator and denominator to the denominator reduction results in question

Equation Scheme Under-Subtracting Above
Originator :
Denominator should not be lumped together in advance
Action and Operation :
Equating the denominator fractions were determined by searching the KPK and the result becomes the denominator fractions were then asked to divide the denominator by the denominator of each note and the result should be multiplied by each numerator is then added
Expected Results :
The result of the addition of fractions numerator be asked numerator and denominator to the denominator of the equation results in question

Direct Scheme of Reduction Above-Middle Bottom Equation
Originator :
Asked denominator equal to the fractional denominator middle

Action and Operation :
Subtracting the known numerator and denominator of a fraction equalize middle
Eexpected Results :
The result of the reduction of the numerator becomes the numerator and denominator fractions were asked in question is equal to the denominator of the middle fractions

Skim reduction fractions of the students to each other of course different. Here is the use of various schemes in different contexts made about each student.

Table 3. Used Scheme for Each Student

STUDENT	USED SCHEME
NS	1. Direct Scheme of Reduction Above 2. Direct Scheme of Subtracting Above 3. Equation Scheme Under-Reduction Above 4. Equation Scheme Under-Direct Reduction Above 5. Direct Scheme of Subtracting Above-Subtracting Under
SR	1. Direct Scheme of Reduction Above 2. Direct Scheme of Subtracting Above 3. Equation Scheme Under-Reduction Above 4. Direct Equation Scheme Above-Reduction under 5. Equation Scheme Under-Direct Reduction Above 6. Direct Scheme of Subtracting Above-Subtracting Under
FK	1. Direct Scheme of Reduction Above 2. Guessing Scheme Above 3. Direct Scheme of Reduction Above-Reduction under 4. Direct Scheme of Subtracting Above-Equation of right under 5. Direct Scheme of Reduction Above-Equation of bottom center
MA	1. Direct Scheme of Reduction Above 2. Direct Scheme of Subtracting Above 3. Equation Scheme under-Reduction Above 4. Direct Scheme of Subtracting Above-Reduction Under
WU	1. Direct Scheme of Reduction Above 2. Direct Scheme of Subtracting Above 3. Equation Scheme under-Reduction Above 4. Equation Scheme under-Subtracting Above

Conclusion

Based on the results of the research, discussion, and findings in this study indicate that there is some process/model of thinking that students use in solving fractions reduction on the same and different subjects, it shows that the one with the other students have to think of different models in solving about the same. The model provides the foundation for students' thinking in the formulation of the reduction scheme fractions. Eleven fractions reduction schemes have been identified in this research. These efforts are a direct reduction scheme over, scheme over guessing, direct addition of scheme over, scheme under-reduction equation above, scheme directly under the reduction above-reduction, equalization scheme under direct reduction-top, scheme the direct addition of above-under addition, the direct scheme the addition of

above-under equation right, the direct addition of scheme above-under reduction, equalization scheme under-adding up, and scheme over the direct reduction-equalization bottom center.

In this study not only found eleven reduction scheme and its fractions subscheme and its subscheme, but also found another meaning and thought processes that understanding fractions, the reduction of two numbers, the process of searching for the HCF, by means of a double multiplication process, and the process repeated multiplication by the sum.

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