

Long-Division Problems for Elementary Students

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Abstract. The operation of counting numbers is one of the basic mathematical concepts that must be mastered by students. The arithmetic operations consist of addition, subtraction, multiplication and division. The operation of dividing whole numbers is considered difficult to learn and teach. However, it is very important for students because many aspects of mathematics are needed in daily life. In the current situation, it was found that many students had problems learning the concept of long division. This study aims to describe the problems experienced by elementary school students and the factors that cause students difficulties in completing long-division operations. The method used is qualitative by collecting library data. The subjects in this study were articles related to the problems faced by elementary school students in completing long-division operations. Documenting data collection and the use of articles related to students' problems in solving long-division operations. Based on this study, the problems experienced by students were not mastering the concept of multiplication, errors found in counting, not being fluent in using operations or procedures, and not understanding the origin of the long division concept. Factors causing these difficulties are external factors that come from the teacher and the environment. While the internal factors come from the students themselves.

Keywords: Long-division, whole numbers, elementary students.

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INTRODUCTION

Mathematics is an indispensable basic science as a foundation for Science and Technology. Through Mathematics a person will have high skills in terms of abstraction, problem analysis and logical reasoning. Yuniarti, Y. (2014) stated that Mathematics as a tool to develop ways of thinking, is indispensable both for everyday life and in the face of advances in Science and Technology, therefore, the need to master mathematics must be emphasized even more since elementary school and even kindergarten age.

Mathematics is the science of numbers, relationships between numbers, and operational procedures used in solving problems regarding numbers (Depdiknas, 2003). Mathematics is given to equip students with the ability to think logically, analytically, systematically, critically and creatively, as well as the ability to work together (Utari, D. R., Wardana, M. Y. S., & Damayani, A. T., 2019; Yayuk, E., 2019). In addition, Mathematics is needed to prepare students who are independent and able to overcome problems that arise in life. Every citizen needs mathematical concepts and skills for budgeting and saving, financing a house or car, calculating a tip at a restaurant, or estimating distances and gas mileage (Kennedy, L.M. et.al, 2008).

Mathematics is a lesson that is not just a collection of numbers, symbols and formulas that have nothing to do with the real world. Instead, mathematics grows and takes root in the real world. Mathematics learning is not just learning in the classroom but can be applied in everyday life, so elementary school students need to understand mathematics lessons (Diyah, A., 2021).

The ability to use numbers, data, and mathematical symbols is related to numeracy literacy. This ability can be used to help solve the problems of human life. However, only a small percentage of people take advantage of this ability. The basic concepts of counting have been mastered but the skill of applying them in real situations and unstructured problems is sometimes overlooked (Pangesti, F. T. P., 2018).

Many people define mathematics differently depending on their profession and needs. Because Mathematics is present in people's lives according to its benefits and functions to everyone who uses it (Prasetyo, A, 2014).

Learning mathematics in elementary school is never separated from the material of number counting operations, addition, subtraction, multiplication and division operations. Mastery of counting operations is very important because it will be the basis for those who want to learn mathematics, therefore the concept of counting must be truly understood by those who will learn mathematics (Hasan, Q. A., 2017).

The division count operation is defined as repeated subtraction. The division is the opposite of the multiplication operation. If a number a divided by the number b produces the number c , ($a:b=c$) then the concept of multiplication is ($b \times c=a$). Division operations have properties similar to subtraction operations i.e. they do not meet the nature of the exchange, the nature of identity, and the nature of grouping.

Division operations are an important topic in mathematics learning in elementary schools. However, division operations are a basic calculating concept that is seen as difficult to learn. Andriyani, M., Pranata, O. H., & Karlimah, K. (2021) stated that students can solve problems regarding division if they have understood the concept of multiplication, because the division is the opposite of multiplication, and multiplication is essentially a simplification of addition. Thus, before the student learns the operation of calculating division, the student must master the prerequisite abilities of the material of the division calculation operation.

In the division calculation operation, if the value of a number that is too large is divided by an iterative process of subtraction, then the way to divide the number is using a stacked division. The composed division in Javanese terms is known as Porogapit. There are two kinds of stacked divisions, namely, long-stacked divisions and short-stacked divisions. Based on Permendikbud No. 7 of 2022 concerning content standards, the material for division by stacking began to be taught for the first time in grade III at the SD/MI level.

Given the importance of mastering the concept of numeracy, the division operation needs to be truly mastered by students. But in the meantime, Mathematics is still considered a daunting lesson for students. Elementary school students and even college students consider Mathematics to be a difficult science to understand because it is abstract (Yeni, E. M., 2015). This is a challenge for teachers to package abstract Mathematics material into real life in the minds of students.

Marlina (2019) states that many children experience learning difficulties, especially difficulties in numeracy lessons. In early childhood, it is often difficult to have difficulties regarding the basic concepts of counting, while older children it has difficulties in solving numeracy problems. However, further researchers' learning difficulties are problems that must be addressed early because they will affect children in subsequent academic careers.

Many factors affect mathematics learning difficulties, such as lack of interest and motivation in mathematics, improper learning in teaching mathematics, and lack of support from parents and the surrounding environment in mathematics lessons for children due to the lack of understanding of parents and the environment towards mathematics. Several factors cause dents to make mistakes in solving math problems. Soleh, M (2012) stated that the causes of students making mistakes in solving math problems include: (1) Students do not grasp a concept correctly; (2) the student does not grasp the meaning of the symbol; (3) Students do not understand the origins of a principle; (4) Students are not fluent in using operations or procedures; (5) Students are not comprehensive.

Online learning that has been carried out during the COVID-19 pandemic adds to the problems for students when learning Mathematics. The pandemic has turned education into a process that has further made it more difficult for students when learning Mathematics. Annisah, S., & Masfiah, S. (2021) mentioned that the difficulties of learning Mathematics in students during the Covid-19 pandemic are: 1) difficulty understanding solvingolve math problems, 2) difficulty concentrating and being easily bored doing mathematics learning activities, 3) difficulty using or utilizing technology for learning activities.

Several studies related to the problem of learning mathematics for elementary school students on the concept of calculating operations proposed by Nurjannah, N., Danial, D., & Fitriani, F. (2019) learning difficulties experienced by students are the lack of understanding of the concept of negative integer counting operations, making it difficult for students to abstract, generalize and remember the concepts or principles of operation of calculating integers. In

addition, Amaliyah, A., et al. (2022) stated that not all students are able to understand the material of integer division due to the limitations of memorization of multiplication, especially how to calculate the division in the array.

The problems experienced by students must be known by the teacher for the smooth process of learning and teaching. When difficulties in learning mathematics are left alone, it will have a bad impact on students such as a lack of interest in mathematics, laziness and boredom with learning mathematics. Thus, mathematics will continue to be a subject that students do not like. So that countermeasures are needed so that students who have difficulty learning mathematics can be dealt with immediately.

Based on the description above, several previous studies have examined the difficulty of students in solving problems about calculating operations. Researchers will describe and uncover the problems experienced by students in completing long-stacked division counting operations on small numbers and factors that affect students' difficulty in completing long-stacked division calculation operations on small numbers for elementary school students in the conditions of the COVID-19 pandemic.

METHOD

This research is classified as library research conducted by examining some of the results of previous research related to the problems of elementary school students in long-structured division calculation operations. Library research is a study of discussions on a topic that has been written by researchers or scientists from various sources (Sari, N. P., Yufiarti, Y., & Makmuri, M., 2022).

This research was conducted in three stages of research consisting of the stage of collecting data on the problem of understanding the concept of division, the factors causing the problem and how solutions can be applied in elementary schools, and the stage of analyzing all the data obtained based on the author's thoughts, as well as concluding the results of the literature review analysis.

The method used in the research is the qualitative descriptive method. The purpose of the study was to describe the problems experienced by students and the factors that caused students to have difficulty in completing long-arranged division operations on small numbers.

The subject of this study is several articles from previous studies related to students' problems in completing long-stacked division count operations. The selected journals are from 2019-2022 indexed by S1, S2 and several indexed international journals. The researchers selected 10 articles that are closely related to students' problems in completing the long-stacked division calculation operation on the number and the factors that cause students' difficulty in completing the long-stacked division calculation operation in elementary school students. Researchers conducted documents and reviewed articles relating to the difficulties students experienced and the factors that caused students' difficulty in completing long-stacked division counting operations in elementary school students.

The technique used to analyze data is qualitative descriptive analysis, namely by describing research results which are then supported by various previous research results.

RESULTS

The research results are based on each stage of the research, so there are research results consisting of the results of the first research related to the screening process of scientific articles. The screening process is carried out by searching for articles through the Google Scholar search engine using the keywords mathematics problems of elementary school students and the concept of division. Then screening or filtering data is carried out which is useful for choosing research problems that are suitable for the topic.

After screening, the results of 10 journals will be analyzed to get a theoretical basis that can support the solution to the problem under study. After the screening process is carried out, a process of drawing research conclusions is carried out in the form of shortened statements regarding the results of the description analysis derived from facts or logical relationships and contains answers to questions posed in the problem formulation section.

The results of the second study are related to the stage of the description of research data. The description of the research data is grouped based on several aspects, consisting of scientific articles from national or international journals, and scientific articles with qualitative or quantitative research designs.

Table 1. Recapitulation of Findings

Article Title	Findings
Cahyadi, F., & Wakhyudin, H. (2020). Analysis of the Difficulties of Grade II Elementary School Students in Solving Mathematical Problem Solving Problems of Multiplication and Division Materials. <i>Gentala Journal of Primary Education</i> , 5(2), 183-190.	The problems that students experience, including because students have not memorized multiplication and division, students have not been able to understand math story problems, students do not know the first steps to do math story problems, students are not careful in counting, students are not focused when learning and there is a misconception on the material of multiplication and division
Diyah, A., et al. (2021). Analysis of Conceptual Errors in Solving Problems for the Division of Elementary School Students. <i>Leibniz: Journal of Mathematics</i> , 1(2), 39-53.	Some elementary school students do not understand the concept of division.
Qadarsih, N. D. (2017). The Influence of Habits of Mind on Mastery of Mathematical Concepts. <i>SAP (Education Article Layout)</i> , 2 (2), 181–185	The successful mastery of early mathematical concepts in students paves the way for the delivery of further mathematical concepts.
Jamaris, M. (2014). Learning Difficulties: Perspectives, Assessments, and Countermeasures for Early Childhood and School Age. <i>Beautiful Ghalia</i>	A child who has difficulty learning mathematics has the characteristic of lacking an understanding of mathematical language.
Yeni, E. M. (2015). Difficulty learning mathematics in elementary school. <i>Journal of Basic Education (JUPENDAS)</i> , 2(2).	The problems made by students in solving division questions are miscalculations and errors in the application of division, entering numbers or data incorrectly, rushing to solve or do questions, and Lack of observance and meticulousness in solving or doing problems
Nurjannah, N., Danial, D., & Fitriani, F. (2019). Diagnostics of Mathematics Learning Difficulties of Elementary School Students on The Operation Material Of Calculating Negative Integers. <i>Didactics: Journal of Education</i> , 13(1), 68-79.	Students make mistakes in solving math problems including (1) Students do not grasp a concept correctly; (2) the student does not grasp the meaning of the symbol; (3) Students do not understand the origins of a principle; (4) Students are not fluent in using operations or procedures; (5) Students are not comprehensive.
Yusmanita, S. (2018). Application of Realistic Mathematics Education to Improve the Ability of Multiplication and Division Calculation Operations. <i>Journal of Elements</i> , Vol. 4 No. 1	In understanding the operation of calculating divisions, several things are often difficult for students to solve, namely: (1) misconceptions, (2) misunderstandings of the problem, and (3) miscalculations.

Article Title	Findings
Sulthon. (2020). Building An Understanding of Basic Concepts of Mathematics in Children With Difficulty Learning Mathematics in MI. Primary: Journal of Basic Science and Education, Vol 12, No 01, pp. 27-40	The math problems experienced by elementary school students are: a. Low basic skills in Mathematics b. A misconception occurred c. Procedural errors d. Computational error Factors that cause mathematical problems experienced by elementary school students, namely internal factors that come from within the student and external actors, namely factors that come from outside the student.

Students' Problems in Completing Long-Division Operations

One of the problems in learning mathematics experienced by elementary school students is the lack of numeracy skills. The ability to count is one of the most important abilities to be taught to students. Numeracy is very closely related to human life. Because counting cannot be separated from practice in everyday life. Thus, the ability to count can be used as a provision in solving problems in everyday life.

The lack of numeracy skills is a problem that hinders students from understanding the concept of division counting operations. Based on the results of the analysis that has been carried out by researchers, the problem of students in completing the long-stacked division calculation operation is as follows:

Difficulty in understanding the concept of multiplication

As part of basic arithmetic, the long division is a way to solve and find answers to the problem of the division of length from a number consisting of at least two numbers. Based on the results of the analysis, students do not understand the prerequisite material, both properties, formulas and the process of workmanship. Students have not memorized multiplication.

Research Through the results of the study, it was found that some elementary school students did not understand the concept of division. But not a few students already understand the concept of division. Understanding the concept of division for some students varies, some students understand division is the opposite of multiplication. Some students understand the concept of division as a form of turus which becomes a symbol of a number that is divided then turus is reduced by a divisor and so on repeatedly, the concept means that division is a repeated subtraction (Diyah, A., et al., 2021).

The successful mastery of initial mathematical concepts in students paves the way for the delivery of further mathematical concepts so that students will more easily understand mathematical concepts in the next material (Qadarsih, 2017). When students have not mastered mathematical concepts, students will have difficulty learning further mathematical concepts.

Carelessness in calculating

In general, the mistakes made by students in solving division questions are miscalculations and errors in the application of division, entering numbers or data incorrectly, rushing to solve or do questions, and Lack of observance and meticulousness in solving or doing questions. Difficulties in counting operations can occur because students make mistakes in operating numbers incorrectly. Students also have difficulty in counting skills because they are not careful when calculating according to the opinion (Runtukkahu, 2014) that students who have difficulty learning mathematics often make mistakes in counting

Not fluent in using operations or procedures

Due to a lack of language acquisition, students do not understand the questions given. The student does not know the procedure he will perform after getting information from the questions. In addition, students do not know the information that can be useful from the question because there is an error in the interpretation of the question. (Jamaris, 2014) that children who have difficulty learning mathematics have a lack of understanding of mathematical language. This lack of understanding results in students having difficulty in making meaningful relationships with mathematics, such as what happens in solving problem counting problems presented in the form of stories. Yusmanita, et al (2018) that in understanding the operation of calculating divisions things are difficult for students in solving, namely: (1) misconceptions, (2) errors in understanding the problem, (3) miscalculations.

Cahyadi, F., & Wakhyudin, H. (2020) stated that story problems are mathematical problems that in their work need understanding and can not only be solved using one method but in various ways, even a combination of many ways. Thus, these various solutions, it es it difficult for students to solve math story problems.

Not Understanding the Origins of the Long- Division concepts

Student difficulties caused by a lack k of arithmetic operational skills are difficulties caused by the lack of ability to operate precisely the quantities contained in the questions. Cahyadi, F., & Wakhyudin, H. (2020). Stating that the problems that students do, including because students have not memorized multiplication and division, students have not been able to understand math story problems, students do not know the first steps to do math story problems, students are not careful in counting, students are not focused when learning and the occurrence of misconceptions on multiplication and division materials. In teaching the operation of calculating long-stacked divisions, teachers must explain the procedure for long-stacked division based on solving strategies that have been studied and discussed together in previous learning. So an improvement in the thought process is obtained: from a relatively informal way to a formal way.

Based on Sulthon's research, (2020) the mathematical problems experienced by elementary school students are:

- a. Low basic mathematics skills related to misreading problems, understanding problems, transformations, and skills of the answer writing process;
- b. There is a misconception, namely an error in determining the theorem/formula and not writing down the theorem/formula;
- c. Procedural errors i.e., the inability to manipulate the steps of solving Mathematical problems, and not using the reasoning of conclusions correctly;
- d. A computational error consisting of an error in manipulating the operation, and not checking the result of the count is returned.

Factors causes of Mathematics problems experienced by elementary school students

Based on the results of the study, there are external and internal factors that cause students problems in completing the division calculation operation. The factors that cause students are as follows:

Based on Sulthon's research, (2020) the factors causing mathematical problems experienced by elementary school students are:

1. Internal factors are factors that originate from within the student such as; a) Low interest and motivation to learn students to master Mathematics, b) Low intellectual abilities of children, c) Wrong perception of Mathematics, ad d) Lack of mastery of basic concepts of Mathematics.
2. External factors are factors that come from outside the child's self-such as; a) Teachers do not master the mathematics material presented or taught, b) Teachers do not understand the characteristics of students in learning mathematics so that the selection of materials and strategies used is less relevant to students. These factors can result in students being less excited and not interested in the mathematics learning that is carried out. Thus, learning

objectives are difficult to achieve optimally. c) Teachers are less able to use active, innovative, creative, effective and fun learning techniques, d) Lack of fulfilment of student books, e) School environment and community environment that are less supportive, f) In general, the approach to teaching mathematics in Indonesia still uses a traditional or mechanistic approach that emphasizes the process of 'drill and practice so that students are trained to do problems such as mechanics or machines, g) Assessments that place more emphasis on the final assessment (learning outcomes) and pay less attention to the process, so that mathematics learning is less meaningful; prioritizing memorization over understanding, h) The learning process tends to be textbooks and related to daily life, so students do not live or understand mathematical concepts, and students have difficulty applying mathematics in everyday life.

In addition to the factor of oneself, the factor of learning activities in the classroom is a consideration that must be found a solution to solve it. Improper, efficient and effective learning from teachers will make children's learning difficulties more difficult (Yeni, E. M., 2015). Teachers must consider the difficulty of mathematics for children and know the background of children's abilities in notable design good and appropriate mathematics learning for children. Teachers must be able to provide more services and guidance for children with difficulties in learning mathematics in the classroom. The solution that teachers can provide is to carry out remedial learning for children with difficulty learning mathematics.

The presentation of the concept of counting needs attention. This is in bye statement of Kennedy and Tips (1994: 342) which states that teaching in the early stages of introducing abstract form counting operations is still difficult for students to understand, therefore a learning environment is needed in real situations and in a simple way to students in to able to understand abstract concepts.

In this case, the researcher did not make efforts to overcome the difficulties of learning mathematics, but the researcher described the efforts that had been made and provided suggestions to overcome the difficulties of learning mathematics. The efforts that can be made to overcome the problems experienced by students in calculating operations can be explained as follows: a) Using concrete learning media, the use of concrete learning media is very important in mathematics learning because students cannot think abstractly. b) Increase the practice of questions. How to give more practice questions does not have to be done in class, practice questions can be given as homework to further monitor the development of students' abilities. c) Cooperating with parents, parents have an important role in motivating students. Students who are given good attention at home will have good learning motivation at school.

CONCLUSION

Learning problems can be experienced by students in mathematics lessons, including in the material of division calculation operations. This problem prevents students from achieving the desired learning outcomes. The problems experienced by students in completing long-stacked calculation operations are that students do not master the concept of multiplication, have errors in counting, are not fluent in using operations or procedures, do not understand the origins of the concept of long-stacked division, and have difficulties when solving story problems.

The problems experienced by students in completing this long division are caused by external factors and internal factors. External factors that cause students to have difficulty in completing long-division calculation operations are teacher factors, facilities and infrastructure, and environmental factors. The internal factors that cause students to have difficulty in completing the long-division calculation operation are the student's initial knowledge factor, the concept understanding factor, the student's interest and motivation factor and the student's physical condition factor.

Teachers can choose the right learning strategy according to the needs and characteristics of students, take a personal approach to students who lack the motivation to learn, create fun learning, and use innovative learning media so that students are interested in participating in learning. This needs to be done to overcome student problems in solving the problem of long-stacked division calculation operations.

Students who have difficulty learning mathematics need to be given support and motivation to be able to take part in mathematics learning well to achieve the expected learning goals.

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