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Analysis of Mathematical Difficulties Based on Learning Styles Using Newman's Prompts Theory

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Abstract: This study aimed to describe the mathematical difficulties of 6th-grade students in solving open-ended problems in fractional material based on learning styles using Newman's Prompts theory. This study used a qualitative research method with a content analysis design and type of case study. The subjects in this study were conducted with 6 students in 6th grade at Bogem Elementary School, including 1 male student and 1 female student with a visual learning style, 2 female students with an auditory learning style, and 2 male students with a kinesthetic learning style. The research subject selection technique used in this study was purposive sampling. Data collection techniques used questionnaires, tests, interviews, and observation. Data analysis was done through data reduction, presentation, and conclusion. The validity of the data used triangulation techniques. The results of this study indicated that: 1) Students with visual and auditory learning styles were able to solve problems at the reading and understanding stage of the problem and experienced difficulties at the transformation stage, processing skills, and writing the final answer, 2) Students with kinesthetic learning styles experience difficulties at all stages, namely reading problems, understanding problems, transforming, process skills and writing final answers.

Keywords: Learning styles, mathematical difficulties, Newman's prompts, open-ended problems

1. Introduction

The increasingly complex issues of 21st-century life in the era of the Industrial Revolution 4.0 create challenges for the world of education (Sumaji, 2019). One of the problems widely discussed is the learning system in elementary schools. Generally, elementary school learning still tends to be a teacher-centred direct learning model. In addition, teachers still need to develop problem-solving-based learning, especially with an open-ended style (Sumaji, 2015). Problem-solving is finding solutions to difficulties to achieve goals that cannot be achieved immediately (Polya, 1973). Open-ended problems are problems with many solutions and strategies to solve them (Mahmudi, 2008). Open-ended problems are designed to help maximize creative thinking based on the abilities of each student (Suherman, 2003). It is the cause of the low mathematics learning outcomes of elementary school students because students are not allowed to solve math problems (Sumaji, 2014).

Mathematical problems can be found in students' daily lives (Dwi Irawati, Wanabuliandari, et al., 2022; Sumaji, 2021). Therefore, it is better to start from elementary school learning mathematics, given concerning problems that exist in the surrounding environment and students' daily lives, so that students can think rationally, analytically, systematically, critically and creatively and work together in solving a problem (Hudojo, 2003; Japa & Suarjana, 2014; Subarinah, 2006). The steps in solving problems according to Newman's Prompts theory are five steps, 1) reading the problem, 2) understanding the problem, 3) transformation, 4) process skills, 5) writing the final answer (Anugrah & Kusmayadi, 2019; Noutsara et al., 2021; Priliawati et al., 2019; Singh et al., 2010; Triliana & Asih, 2019; White, 2009). However, most students need to gain problem-solving skills. Students who cannot apply problem-solving skills can experience learning difficulties (Yuliardi, 2017).

Learning difficulties are disorders experienced by a person in understanding a teaching material effectively in the form of difficulty listening, thinking, speaking, reading, writing, spelling or arithmetic due to various factors (Waskitoningtyas, 2016). One of these factors is the characteristics of a person's learning style or understanding of something. Familiar student learning methods are called learning styles (Uno, 2008).

Every student learns differently in solving problems, especially math problems. Learning style describes how an individual learns and focuses on capturing difficult and new information through different understandings (Sastra Negara

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et al., 2021). Learning styles help students maximize the potential of the brain to organize and manage information through physical, visual and mental activity (Hosnan & Sikumbang, 2014; Yusuf & Amin, 2016).
Based on the explanation above, the researcher is interested in knowing how the difficulties experienced by students in solving open-ended problems in fractional material are based on learning styles. Therefore, this study is entitled "Analysis of Mathematical Difficulties Based on Learning Styles Using Newman's Prompts Theory ". This study aimed to describe the mathematical difficulties of 6th grade students in solving open-ended problems in fractional material based on learning styles using Newman's Prompts theory.

2. Literature Review

Teachers who do not pay attention to student learning styles lead to less than ideal learning outcomes in some subject matter, especially mathematics in elementary school, one of which is fractions. The concept of fractions is important to understand because it is material that must be owned and even becomes material tested in tests and exams (Prafitriyani & Dassa, 2016).

Relevant research on problem-solving based on learning styles has been done. (1) Research results (Umrana et al., 2019) show 1) students' mathematical problem-solving abilities according to the visual and auditory learning styles of the Polya stage, namely being able to understand problems, plan problem solving, carry out problem-solving plans and recheck the results of answers, 2) students' abilities in solving mathematical problem solving have kinesthetic learning according to stages The ability of the Polya style can understand problems well and develop problem-solving plans, indicators of ability to perform calculations based on formulas are mainly used for multiplication, are less able to carry out problem-solving and division plans, and are less able to review problem-solving results. (2) Research results (Setiyadi, 2020) show that 1) The visual learning style can solve problems to the final stage. 2) the Auditory learning style can reach the stage of carrying out a problem-solving plan but is less able to see or re-examine. 3) The kinesthetic learning style can reach the stage of carrying out plans to solve problems but cannot see or check again. 3) The kinesthetic learning approach can reach the stage where the problem-solving plan is implemented but cannot be re-examined. (3) Research results (Sastra Negara et al., 2021) show that students with a strong visual learning style have better problem-solving skills than students with auditory and kinesthetic learning styles, while students with an auditory learning style have better problem-solving skills than students with visual and kinesthetic learning styles on students on problem-solving skills The low one.

Based on the research results, this is the first time anyone has studied the analysis of students' difficulties in solving open-ended problems based on student learning styles. Learning style-based analysis of students' difficulties in solving open-ended questions in this study used Newman's Prompts theory. In contrast, previous research generally used the Polya stages to analyze learning style-based mathematical problem-solving. Newman's Prompts theory is a theory put forward by Anne Newman to find mistakes students make when solving problems. If errors are found, it will be easier to see students' difficulties (Veny, 2021). Several steps to find student difficulties include: 1) reading the problem, 2) understanding the problem, 3) transformation, 4) process skills, and 5) writing the final answer. Students can be said to have no difficulty solving math problems if they use these five stages to solve problems. So Newman's Prompts theory is one way to analyze students' difficulties in solving math problems through five successive stages. Open-ended problems give students many opportunities to get ideas to develop their problem-solving skills (Sumaji, 2018). Furthermore (Sumaji, 2018) explains that open-ended problems are open questions that give students several correct answers.

3. Methodology

This study uses a qualitative research method with a content analysis design and type of case study. This research was conducted at Public Elementary School Bogem on August 15, 2022, starting with giving a questionnaire to 6th-grade students. The 16 conducted tests and observations, while the interviews were on August 18, 2022. The technique for selecting research subjects used a purposive sampling technique. The following is a chart of the process of determining research subjects.

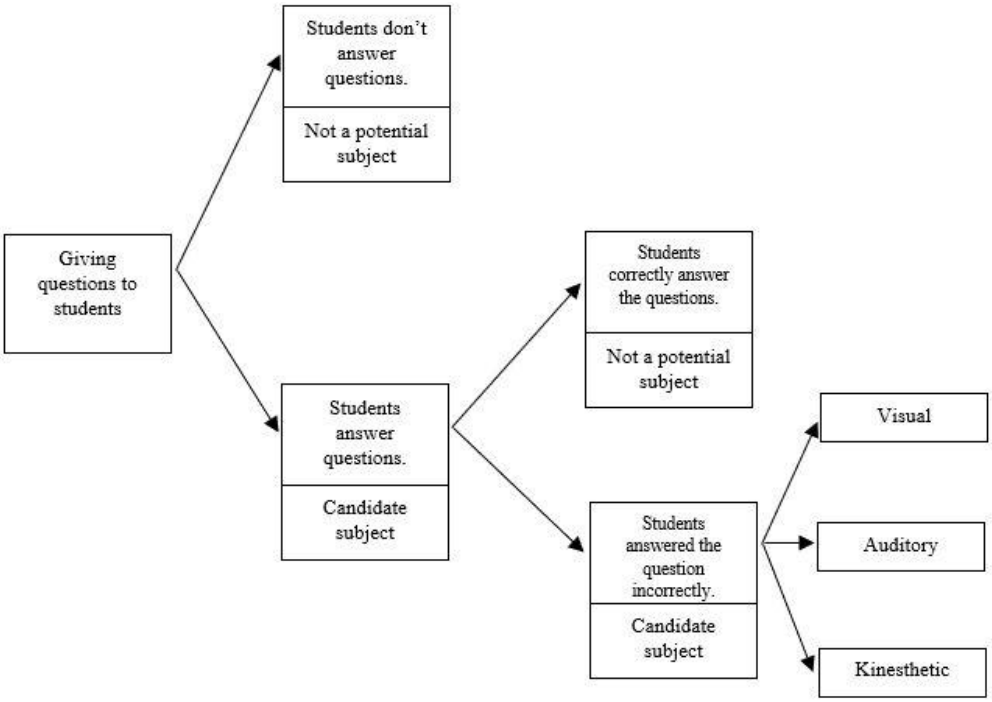

Figure 1. The process of determining research subjects

Questionnaires were given to 20 6th students to determine learning styles. The results showed 7 students with a visual learning style, consisting of 3 boys and 4 girls. There are 7 students with auditory learning styles, all girls. Meanwhile, there are 6 students with kinesthetic learning styles, consisting of 5 boys and 1 girl. After knowing the learning style, given a problem-solving test to students. In this study, the researcher chose 6 out of 20 students as subjects, including 1 male student and 1 female student with a visual learning style, 2 female students with an auditory learning style, and 2 male students with a kinesthetic learning style. The selection of research subjects was only for 6 students because they were the easiest to communicate with and explore information, which really helped the course of research.

Table 1. Research subjects

Name	Gender	Learning style
ANM	Woman	Visual
MLI	Man	Visual
AAR	Woman	Auditory
LSB	Woman	Auditory
BS	Man	Kinesthetic
CDA	Man	Kinesthetic

Data collection techniques were collected through questionnaires, tests, interviews, and observations. At the same time, data analysis is done through data reduction, data presentation, and conclusion. The validity of the data was tested using technical triangulation to check information/data from questionnaires, tests, interviews and observations.

4. Results

After knowing the learning style, a problem-solving test is given to students as follows:

Mrs Sinta has $4\frac{2}{5}$ kg of sugar. 40% of the sugar is used to make cakes, while $\frac{2}{3}$ of the rest is used again to make pudding. The rest of the sugar is used to make 2 glasses of drink with the same amount. How many kg of sugar is in each glass?

After being given a problem-solving test, the data was analyzed using Newman's Prompts problem-solving theory. The results and discussion of each student's learning style can be seen as follows:

4.1 Problem Solving Ability of Visual Learning Style (ANM and MLI)

4.1.1 Problem Reading Stage

The results of ANM's work at the problem reading stage on fractional material questions can be seen in the following interview excerpts.

P :"Have you ever seen something like this?"

ANM :"Yes sir, but I forgot."
P :"Try to say the keywords in the problem!"
ANM :"Have granulated sugar, make cakes, puddings and drinks."

Based on the interview excerpts above, ANM can interpret words, terms, and symbols in reading all problems well. The results of MLI's work at the reading stage of fractional material problems can be seen in the following interview excerpts.

P : "Have you ever seen something like this?"
MLI : "Yes sir, but forgot."
P : "Try to say the keywords in the problem!"
MLI : "Sugar, cake, pudding and drinks."

Based on the interview excerpts above, MLI can interpret words, terms, and symbols well in reading all problems. Thus, students with a visual learning style can read problems well.

4.1.2 Understanding the Problem Stage

The results of ANM's work at the stage of understanding the problem in fractional material questions can be seen in the following interview excerpts.

P :"What do you know about this question?"
ANM :"Mother has kg of sugar used to make cakes, puddings, and $4\frac{2}{5}$ *drink."*
P :"What is asked of the question?"
ANM :"Many measures of sugar per glass."

From the interview excerpt above, it can be seen that ANM could answer what was known and asked based on the question requests, even though he did not write down what was known and asked on the answer sheet. While the results of MLI's work at the stage of understanding the problem of fractional material can be seen in the interview excerpts.

P :"What do you know about this question?"
MLI :"Mother has kg of sugar. After that it is used to make cakes, $4\frac{2}{5}$ *puddings, and drinks."*
P :"What is asked of the question?"
MLI :"How many doses of sugar per glass."

The interview excerpt above shows that the MLI ANM could answer what was known and asked based on the question requests, even though he did not write down what was known and asked on the answer sheet. Thus, students with a visual learning style can understand the problem well.

4.1.3 Transformation Stage

The results of ANM's work at the transformation stage on fractional material questions can be seen in Form. 1.

$$4\frac{2}{5} - 40\% - \frac{2}{3} = \quad (1)$$

Formula 1. ANM transformation stage

The Form. 1, shows that ANM wrote a mathematical model or formula when working on the problem, but it needed to be corrected or completed. Meanwhile, the results of MLI's work on problem-solving abilities at the transformation stage on fractional material questions can be seen in Form. 2.

$$4\frac{2}{5}\ x\ \frac{40\%}{100\%}\ x\ 2\ \frac{2}{3}\ x\ 8\ \frac{8}{300\%} = \quad (2)$$

Formula 2. MLI transformation stage

The Form. 2, shows that the MLI wrote a mathematical model or formula when working on a problem, but it needed to be corrected or completed. Thus, visual learning style students have difficulty at the transformation stage.

4.1.4 Process Skills Stage

The results of ANM's work on the process skills stage on fractional material questions can be seen in Form. 3.

$$\frac{6}{5} - \frac{40}{100} - \frac{2}{3} = \quad (3)$$

Formula 3. ANM process skills stage

Based on Form. 3, it can be seen that ANM uses the wrong method, so it cannot calculate when solving problems. Meanwhile, the results of MLI's work on the process skills stage on fractional material questions can be seen in the following interview excerpts.

P : "Can you change mixed fractions to improper fractions?"
MLI : "No sir, have forgotten how."
P : "Can you explain how to calculate your formula write?"
MLI : "I cannot, sir."

The interview excerpt above shows that MLI uses the wrong method and cannot calculate when solving problems. Thus, visual learning style students have difficulty at the stage of process skills.

4.1.5 Final Answer Writing Stage

The results of ANM's work at the writing stage of the final answer on fractional material questions can be seen in Form. 4.

$\frac{32}{33}$ So, many measurements of granulated sugar are $\frac{32}{33}$ (4)

Formula 4. Stages of writing ANM's final answers

From the Form. 4, it can be seen that ANM could conclude and write down the final answer, but it was wrong. Meanwhile, the results of MLI's work at the stage of writing the final answer to the fractional material questions can be seen in Form. 5.

$$\frac{16}{24} \quad (5)$$

Formula 5. MLI final answer writing stage

From Form. 5, it can be seen that MLI was able to write the final answer, but it was wrong. Thus, visual learning style students have difficulty at the stage of writing the final answer.

4.2 Problem Solving Ability of Auditory Learning Style (AAR and LSB)

4.2.1 Problem Reading Stage

The results of AAR's work at the problem reading stage on fractional material questions can be seen in the following interview excerpts.

P : "Have you ever seen something like this?"
AAR : "Yes sir, in grade 5."
P : "Try to say the keywords in the problem!"
AAR : "Mom had granulated sugar and used it to make cakes, puddings, and drink."

From the interview excerpt above, AAR can interpret words, terms, and symbols in reading all problems well. The results of LSB's work at the stage of reading the problem on fractional material questions can be seen in the following interview excerpts.

P : "Have you ever seen something like this?"
LSB : "Yes sir, but forgot when."
P : "Try to say the keywords in the problem!"
LSB : "Sugar, cake, pudding and drinks."

From the interview excerpt above, LSB can also interpret words, terms, and symbols in reading all problems well. Thus, students with an auditory learning style can read problems well.

4.2.2 Understanding the Problem Stage

The results of AAR's work at the stage of understanding the problem in fractional material questions can be seen in the following interview excerpts.

P : "What do you know about this question?"
AAR : "From these questions, there are those that are reduced and divided."
P : "What is asked of the question?"
AAR : "Many measures of sugar in each glass."

From the interview excerpt above, it can be seen that AAR could answer what was known and asked based on the question request, even though he did not write down what was known and asked on the answer sheet. The results of LSB's work at understanding the problem in fractional material questions can be seen in the following interview excerpts.

P : "What do you know about this question?"
AAR : "Mother has sugar and uses it to make cakes, puddings, and drinks."
P : "What is asked of the question?"
AAR : "The number of doses of sugar in each glass."

From the interview excerpt above, it can be seen that LSB could answer what was known and asked based on the question request, even though he did not write down what was known and asked on the answer sheet. Thus, students with an auditory learning style can understand the problem well.

4.2.3 Transformation Stage

The results of AAR's work at the transformation stage on fractional material questions can be seen in Form. 6.

$$4\frac{2}{5} - \frac{40}{100} = \frac{2}{3} \qquad (6)$$

Formula 6. AAR transformation stage

The Form. 6, shows that AAR wrote a mathematical model or formula when working on a problem, but it needed to be corrected or completed. The results of LSB's work at the transformation stage on fractional material questions can be seen in Form. 7.

Answer:

$$= 4\ \frac{2}{5}\ x\ 40 \qquad (7)$$

Formula 7. LSB transformation stage

From the Form. 7, LSB writes a mathematical model or formula when working on a problem, but it needs to be corrected or completed. Thus, it can be concluded that auditory learning style students have difficulty at the transformation stage.

4.2.4 Process Skills Stage

The results of AAR's work on the process skills stage on fractional material questions can be seen in Form. 8.

$$\frac{2}{3} : 2 = \frac{2}{6}\ kg \qquad (8)$$

Formula 8. Stages of AAR process skills

The Form. 8, shows that AAR uses the wrong method and cannot calculate correctly when solving problems. The results of LSB's work on the process skills stage on fractional material questions can be seen in Form. 9.

$$= 2: \frac{2}{3}\ x\ 2 \qquad (9)$$

$$= \frac{2}{6} : 2$$

$$= \frac{2}{12}$$

Formula 9. LSB process skills stage

The Form. 9, shows that the LSB uses the wrong method, so it cannot calculate correctly when solving the problem. Thus, it can be concluded that auditory learning style students need help at the stage of process skills.

4.2.5 Final Answer Writing Stage

The results of AAR's work at the stage of writing the final answer to fractional material questions can be seen in Form. 10.

$$So, the\ number\ of\ measurements\ of\ granulated\ sugar\ per\ glass\ is\ \ldots \frac{2}{6}\ kg \qquad (10)$$

Formula 10. AAR final answer writing stage

From the Form. 10, it can be seen that AAR was able to conclude or write down the final answer, but it was wrong. Meanwhile, the results of LSB's work in the final answer writing stage on fractional material questions can be seen in Form. 11.

$$So, the\ number\ of\ measurements\ of\ granulated\ sugar\ per\ glass\ is\ \ldots \frac{2}{12}\ kg \qquad (11)$$

Formula 11. LSB final answer writing stage

From the Form. 11, it can be seen that LSB can conclude or write down the final answer, but it needs to be corrected. Thus, students struggle to write the final answer in the auditory learning style.

4.3 Problem Solving Ability of Kinesthetic Learning Style (BS and CDA)

4.3.1 Problem Reading Stage

The results of the BS's work at the problem reading stage on fractional material questions can be seen in the following interview excerpts.

P : "Have you ever seen something like this?"
BS : "Forgot sir."
P : "Try to say the keywords in the problem!"
BS : "I do not know sir."

From the interview excerpts above, it can be seen that the BS cannot interpret the words, terms or symbols in the questions. Meanwhile, the results of CDA's work on problem-solving abilities at the stage of reading the problem on fractional material questions can be seen in the following interview excerpts.

P : "Have you ever seen something like this?"
CDAs : "Forgot sir."
P : "Try to say the keywords in the problem!"
CDAs : "I do not know sir."

From the interview excerpt above, it can be seen that CDA cannot interpret words, terms or symbols in the questions. Thus, kinesthetic learning style students have difficulty at the problem reading stage.

4.3.2 Understanding the Problem Stage

The results of the BS's work at the stage of understanding the problem in fractional material questions can be seen in the following interview excerpts.

P : "What do you know about this question?"
BS : "I do not know sir."
P : "What is asked of the question?"
BS : "I do not know sir, confused."

From the interview excerpt above, it can be seen that the BS could not answer what was known and asked based on the request for questions. Meanwhile, the results of CDA's work on problem-solving abilities in understanding the problem in fractional material questions can be seen in the following interview excerpts.

P : "What do you know about this question?"
CDAs : "I do not know sir, the problem is difficult."
P : "What is asked of the question?"
CDAs : "I do not know sir."

The interview excerpt above shows that the CDA needed help to answer what was known and asked based on the request for questions. Thus, in kinesthetic learning, students have difficulty understanding the problem stage.

4.3.3 Transformation Stage

The results of the BS's work at the transformation stage on fractional material questions can be seen in Form. 12.

$$4\ \frac{2}{5} - \frac{2}{3} \qquad (12)$$

Formula 12. BS transformation stage

Based on the Form. 12, it can be seen that the BS wrote a mathematical model or formula when working on the questions, but it needed to be corrected or completed. The results of CDA's work at the transformation stage on fractional material questions can be seen in Form. 13.

$$4\ \frac{2}{5} x \frac{40}{100} \qquad (13)$$

Formula 13. CDA transformation stage

The Form. 13, shows that CDA wrote a mathematical model or formula when working on a problem, but it needed to be corrected or completed. Thus, kinesthetic learning style students have difficulty at the transformation stage.

4.3.4 Process Skills Stage

The results of the BS work on the process skills stage on fractional material questions can be seen in Form. 14.

$$\frac{40\%}{100\%} \quad 40 - 25 = 15 - 100 \qquad (14)$$

$$\frac{40}{5} - \frac{15}{2} = \frac{25}{3}$$

Formula 14. BS Process skills stage

Based on the Form. 14, it can be seen that the BS used the wrong method, so it could not calculate correctly when solving the problem. The results of CDA's work on the process skills stage on fractional material questions can be seen in Form. 15.

$$\frac{8}{5}\ x\ \frac{40}{100} = \frac{800}{200} = \frac{2}{3} \qquad (15)$$

Formula 15. CDA process skills stage

The Form. 15, shows that CDA uses the wrong method and cannot calculate correctly when solving problems. Thus, kinesthetic learning style students have difficulty at the stage of process skills.

4.3.5 Final Answer Writing Stage

The results of the BS's work at the stage of writing the final answer on fractional material questions can be seen in Form. 16.

$$\frac{25}{3} \qquad (16)$$

Formula 16. Stages of writing final answers BS

From the Form. 16, it can be seen that the BS was able to write the final answer, but it was wrong. Meanwhile, the results of CDA's work on problem-solving skills at the stage of writing the final answer to fractional material questions can be seen in Form. 17.

$$= \frac{400}{45} \qquad (17)$$

Formula 17. CDA final answer writing stage

From the Form. 17, it can be seen that CDA was able to write the final answer, but it was wrong. Thus, in the kinesthetic learning style, students have difficulty at the stage of writing the final answer. To strengthen the results of the study, observations were made. The following are the results of observations as show in Table 2.

Table 2. Observation results

No.	Observed aspects	Description of observation results
1	Read problem	Visual and auditory learning style subjects understand the language in sentences. In contrast, the kinesthetic learning style subjects do not understand the language in sentences, so students do not know the meaning of the questions given, so students determine the wrong way of solving them.
2	Understanding the problem	Visual and auditory learning style subjects could answer what is known and asked based on the question request even though they did not write down what is known and asked on the answer sheet. In contrast, the subject in kinesthetic learning style needs help to answer what is known and asked based on question requests.
3	Transformation	Visual, auditory, and kinesthetic learning style subjects can be seen to be difficult to translate from word problems to mathematical sentences.
4	Process skills	Subjects with visual, auditory, and kinesthetic learning styles are not accustomed to solving problem-solving questions, so when faced with these problems, students need help to answer correctly. In addition, students need help understanding the concept of fraction material and are not careful and careful; as a result, they are wrong in doing and answering questions.
5	Final answer writing	Subjects with visual and auditory learning styles could write conclusions, but the answers needed to be corrected. Meanwhile, the kinesthetic learning style subject does not write down the conclusion of the answer but only the answer.

Based on the results of questionnaires, tests, interviews, and observations, the results of problem-solving abilities in student learning styles are as follows in Table 3.

Table 3. Results of problem-solving ability given student learning styles learning style

Learning style	**Problem-solving ability stage**				
	1	**2**	**3**	**4**	**5**
Visual	Capable	Capable	Unable	Unable	Unable
Auditory	Capable	Capable	Unable	Unable	Unable
Kinesthetic	Unable	Unable	Unable	Unable	Unable

Description:

1. Stage of reading the problem
2. Stage of understanding the problem
3. transformation stage
4. Process skill stage
5. Writing the final answer stage

5. Discussion

The subject of visual learning in the first stage is reading problems; students can absorb information properly. All visual subject information can process information through its observations in learning. Sahimin et al. (2017) states that the visual learning style prefers reading to reading, and students respond better to learning if the material being studied can be seen, making it easier to understand and understand.

Auditory learning subjects in the first stage can also read problems because when working, groups of auditory students are more dominant, discussing problems to get solutions. Sri (2015) stated that students would like group learning with auditory students. It is because the auditory learning style has characteristics, including internal and external dialogue.

Kinesthetic learning subjects in the first stage are unable to read the problem. When conducting interviews with kinesthetic subjects, students could not read and know the meaning or keywords of the questions. Wulandari (Chania, 2016) stated that the kinesthetic learning style would be better with learning aids to generate curiosity and suppress key concepts.

When understanding the problem, visual and auditory subjects could explain what is known and what is asked in the questions. In contrast, kinesthetic subjects have difficulty conveying what is known and what is asked in the questions. When conducting interviews with kinesthetic subjects, students could not understand the questions, so they could not write down what was known in the questions and what was being asked. In line with Setiyadi (2020) states that visual and auditory subjects could understand problems better than kinesthetic subjects.

The three learning styles have difficulty in the transformation stage, namely when they write formulas but are not precise enough to answer the problems asked. During the observation and interview activities, the three subjects had low ability when correctly transforming problems into mathematical forms or models, students needed help understanding

when choosing which method to use, and students could not determine what formula should be used to solve the problem. Mandasari & Nadjamuddin (2015), state usually students with a visual learning style like to present coherent information and write down the teacher's words. Umrana et al. (2019) explained that auditory subjects had difficulty writing mathematical models, resulting in wrong calculations and expected answers. This error is caused by the difficulty of writing a mathematical model. Umrana et al. (2019) Also explained that kinesthetic subjects had difficulty in writing formulas or mathematical models.

At the stage of process skills, the three learning styles also find it difficult and cannot calculate correctly because of the wrong way of using it. When conducting interviews with the three subjects, the difficulty at this stage was the low ability of students to perform arithmetic operations using the appropriate steps. Students make mistakes in the calculation process and need to be more careful and thorough when working on questions. Students make mistakes in the calculation process; students are not careful and thorough in working on questions. In line with Sastra Negara et al. (2021), where auditory and kinesthetic subjects can explain the sources of their formulas, they focus on understanding the material the teacher explains.

The three learning styles show difficulty in the final answer writing stage when they conclude or write down the final answer but are wrong. The subject has tried at this stage but needs help calculating multiplication and mathematical sentences in the problem. It is appropriate Nurmayani (2016) stated auditory students had problems in work that involved visualization, such as cutting parts to fit one another.

Kinesthetic subjects are unable to write conclusions from the final answer. At the time of the interview, the kinesthetic subject was in a hurry to solve the questions, so the students wrote the wrong final answer. Sri (2015) states that students with kinesthetic learning styles have lower mathematics learning outcomes than those with visual and auditory learning styles. This is because the characteristics of the kinesthetic learning style require individuals to touch something that provides some information so that they can remember it (Nurmayani, 2016).

Based on the results of observations in tests and interviews, the factors that make it difficult for students to solve fractional math problems are as follows: 1) Students do not understand the language in sentences, so students do not know the meaning of the questions given, so students incorrectly determine how to solve them, 2) students have difficulty translating from story problems to mathematical sentences, 3) lack of various problem-solving strategies, 4) students are not used to solving problem-solving questions so that when faced with these problems students cannot answer correctly, 5) when carrying out arithmetic operations they lack accuracy and caution, resulting in students still making mistakes in working on and answering questions, 6) students do not understand the concept of fraction material.

6. Conclusion

Based on the results of the research that has been done, it can be concluded that the difficulties experienced by 6th-grade students at Bogem Elementary School in solving problems with open-ended fractional material based on learning styles using Newman's Prompts theory, namely: 1) Students with visual and auditory learning styles can solve problems at the stages of reading and understanding problems, and have difficulty at stages of transformation, processing skills and writing final answers, 2) Students with kinesthetic learning styles experience difficulties at all stages, namely reading problems, understanding problems, transforming, processing skills and writing final answers.

Moreover, in the future, teachers can develop innovative models, methods, techniques, and teaching strategies by accommodating the three student learning styles to make it easier for students to absorb information, thus increasing interest and academic achievement.

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