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Efforts to Improve Numeracy Literacy Skills of Grade V Students of Elementary School 067694 Medan Through Differentiated Learning

Suwanto[1], Sujoko Waluyo[2], Siti Indriyani[3]
[1] *State University of Medan, Indonesia*
[2] *Hajj University of North Sumatra, Indonesia*
[3] *Elementary School 067694 Medan, Indonesia*

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ABSTRACT

Improving the Numeracy Literacy Skills of Grade V students at SD 067694 Medan is the main objective of this Classroom Action Research. Some high-class students still have difficulty in using mathematical symbols, difficulty interpreting existing data, and making decisions from the analysis they have done. Several efforts have been made such as reading books 15 minutes before entering class, but the results have not been significant in students' numeracy literacy skills. So it is necessary to focus more on smaller subjects in this case the class, and class V was chosen because it does not interfere with the program and for preparation for graduation later. The instruments used in this PTK consist of numeracy literacy test instruments, student activity observation sheets and interviews. The first action taken is to apply differentiated learning based on students' learning styles (Audio, Visual, and kinesthetic), obstacles found in cycle I related to the devices used and students' inflexibility in participating in group learning. In Cycle II, adjusting the condition of the device, and adjusting the number of learning media used. Of the four indicators of numeracy literacy that have increased, the indicator that appears to have a significant increase is the indicator of drawing conclusions. After the actions of cycle I and cycle II were carried out, the students' conclusions were more argumentative and provided quite appropriate reasons. Then, when viewed from the students' learning styles, the activities carried out by students in cycle II were more focused than in cycle I. However, from both cycles, students with a kinesthetic learning style in each learning activity were increasingly active, when participating in learning with learning media.

Keywords
Numeracy Literacy, Elementary School, Differentiated Learning, Learning Styles.

Corresponding Author
suwantompd89@gmail.com

INTRODUCTION

The Numeracy Literacy Movement promoted by the Ministry of Education and Technology since 2016 is a response to the low literacy skills of

students in Indonesia. In addition to the PISA survey from 2006 - 2022, Indonesia's mathematics score decreased to 366 in 2022, which was previously 391 in 2006. (Wijaya et al., 2024)Current technological developments have shifted the meaning of literacy skills not only to reading and writing (Basyiroh, 2017; Fitriani & Aziz, 2019). Literacy skills are the ability to understand, involve, use, analyze and transform knowledge (Yulia & Eliza, 2021). Then literacy skills are divided into several, one of which is numeracy literacy. It should be emphasized that numeracy literacy skills are not the same as students' mathematics learning outcomes (Dantes & Handayani, 2021), numeracy literacy skills are not only the ability to count, but to interpret existing problems with existing mathematical analysis. Therefore, students who are able to answer mathematics theoretically do not necessarily have good numeracy literacy skills. However, the nature of mathematics such as systematic, logical and structured is closely related when finding solutions to a problem.

Triwahyu & Sakinah (2021) formulating numeracy literacy skills is the knowledge and skills to use mathematical symbols, analyze information, interpret results and draw conclusions. Slightly different from Ahadiya et al., (2023)those who state that numeracy literacy skills are basic skills to solve everyday problems through reasoning, communicating and socializing with the surrounding environment. Therefore, this ability is very important for students at the elementary education level, as initial capital to analyze numerical information to solve problems.

In response to the above problems and the importance of numeracy literacy skills for students, various efforts have been made by education providers, both formal and non-formal. One of the efforts made by SD 067694 Medan is to get students used to reading books before entering class and providing math exercises in the form of story problems. However, this step has not shown a significant increase in numeracy literacy, most students are still unable to observe the information available to answer the questions given. Even in high grades, 3 out of 5 students have difficulty using mathematical symbols such as writing fractions, and writing division operations. Then 3 out of 7 students also still have difficulty interpreting the information provided either in the form of pictures/graphs or in table form. Of the four aspects of numeracy literacy assessment, the aspect of reading information in the form of pictures or graphs is better than other aspects. Therefore, there still needs to be an evaluation and reflection of the activity of reading books before entering class and giving math story problems once a week.

On a smaller scale, efforts that can be made are by implementing the right learning model. Based on discussions with fellow teachers and supervisors of

the implementation of KBM, the implementation of differentiated learning is one solution that can be done. In addition to facilitating students to meet their needs when learning, this learning can also increase creativity and cooperation between students. The concept of differentiated learning has the potential to develop students according to their needs, characteristics and levels of achievement, so that differentiated learning provides students with the breadth to learn (Purnawanto, 2023). Then this learning will provide equality for all students, thereby reducing the gap between students when learning. However, the implementation of differentiated learning requires teacher reliability in designing learning that can accommodate all students' learning needs. From several advantages of this differentiated learning, it is interesting to describe how this differentiated learning can improve students' literacy skills, thereby increasing the insight and considerations of education practitioners in implementing this learning.

RESEARCH METHODE

To find the answer to the problem above, the research design used in this study is Classroom Action Research which aims to analyze each action given to students. The stages of PTK consist of 4 stages of planning, implementation, observation and reflection, as in Figure 1. The number of students in grade V, SD 067694 Medan City is 12 students, and it was carried out in the odd semester of the 2024/2025 school year. The instrument for measuring numeracy literacy skills consists of 4 indicators; (1) using mathematical symbols; (2) analyzing questions; (3) interpretation/predicting; and (4) making decisions. In each indicator there are several scoring categories as shown in table 1 below

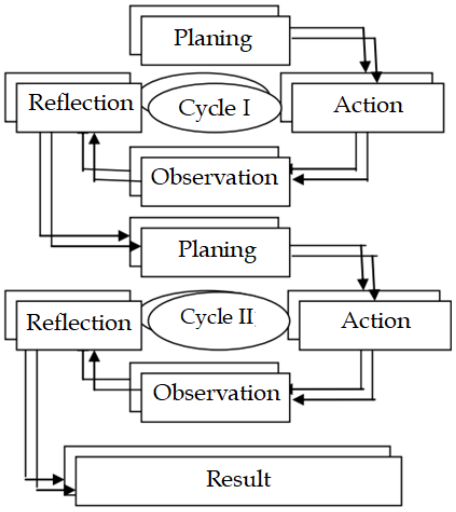

Figure 1.
PTK Cycle (Inayati & Kristin, 2018)

The PTK process is not limited to Cycle II alone, but will stop when students achieve success levels greater than 80%.(Aqib, 2016) and classical completeness exceeds 75% (Choerunnisa et al., 2017). The success criteria include; (1) Very Low if <40%; (2) Low if between 41 – 55%; (3) Medium, if between 56 – 70%; (4) High if 71 – 85%; and (5) Very High, if 86 – 100%.

Table 1.
Numeracy Literacy Scoring

No	Indicator Numeracy Literacy	Assessment Description	Score
1	Using mathematical symbols	Do not use mathematical symbols	0
		Incorrect spelling of mathematical symbols	1
		Using mathematical symbols, but not precisely	2
		Using mathematical symbols correctly and precisely	3
2	Analyzing the question	Not writing down what is known and what is asked	0
		It is not correct to write the data needed and what is asked	1
		Write down the data needed and the root of the problem.	2
		Write down the data needed and understand the root of the problem and provide reasons for each stage of resolution.	3
3	Interpretation/predicting	Does not provide opinions/explanations/estimates from the analysis results	0
		Provide interpretation/prediction of analysis results even if they are wrong	1
		Provide accurate interpretation/prediction	2
4	Make decisions	Does not provide a conclusion	0
		Giving a wrong conclusion	1
		Giving the correct conclusion	2

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RESULT AND DISCUSSION

Cycle I

At the planning stage, the implementation team discussed what things would be prepared to take action on grade V students whose numeracy literacy skills with learning outcomes were sorting decimals and fractions. The implementation team designed learning tools with differentiated learning in the form of teaching modules and learning media. Differentiated learning is designed based on students' learning styles consisting of visual, auditory and kinesthetic. To support this learning design, the learning media that has been designed is in the form of Video to accommodate students with visual and auditory needs, then arranging pieces of teaching aids, related to decimal fractions. In addition to compiling teaching modules with two meetings and learning media (videos and teaching aids), the implementation team also designed test instruments to measure the improvement of students' numeracy literacy skills and observation sheets to observe student activities.

When the planned action was carried out, initially the teacher was able to manage the class well according to the learning stages in the teaching module. However, when playing the video to students via infocus, there were obstacles in the form of limited audio coming out of the laptop, so that students with an auditory learning style could not absorb the information optimally. Although the teacher had tried to reduce this sound barrier by re-explaining what video was being shown, students who could faintly hear the sound from the laptop were actually disturbed. The lack of information or literacy processes that were hampered when the video was played, can be seen from the lack of student response to questions related to the video. Then when using teaching aids, almost all students were active in arranging the pieces of teaching aids that were glued to the student learning activity sheet. At the end of the second meeting, a summative evaluation was carried out on the learning outcomes as well as the students' numeracy literacy skills and the results are as below.

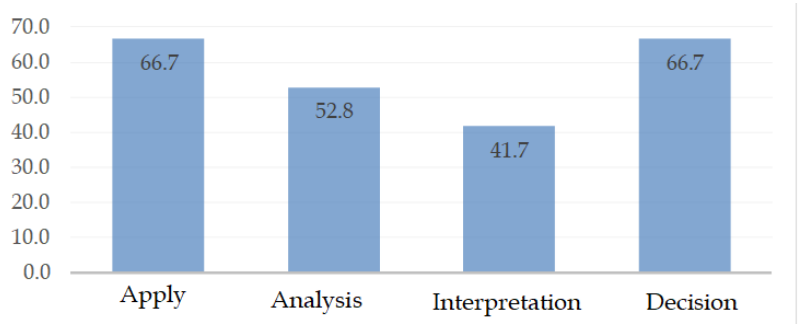

Figure 2.
Numeracy Literacy Abilities in Silus I

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In **Figure 2** above, it can be seen that the aspects of decision making and using mathematical symbols have shown improvement. When determining a decision, students provide reasons, although there are some that are still lacking, but students try to make a decision. Different from when before the action was taken, students tend to be silent when asked to provide an argument/opinion. Then the lowest aspect is the interpretation/prediction aspect (41.7%), in this aspect most students are not yet able to interpret the results of the analysis, there are still limitations in abstract thinking when trying to estimate something fractional form and decimal form. Piaget's cognitive learning stages (Huitt & Hummel, 2003)are the main reason, but this can still be minimized with Bruner's learning theory.

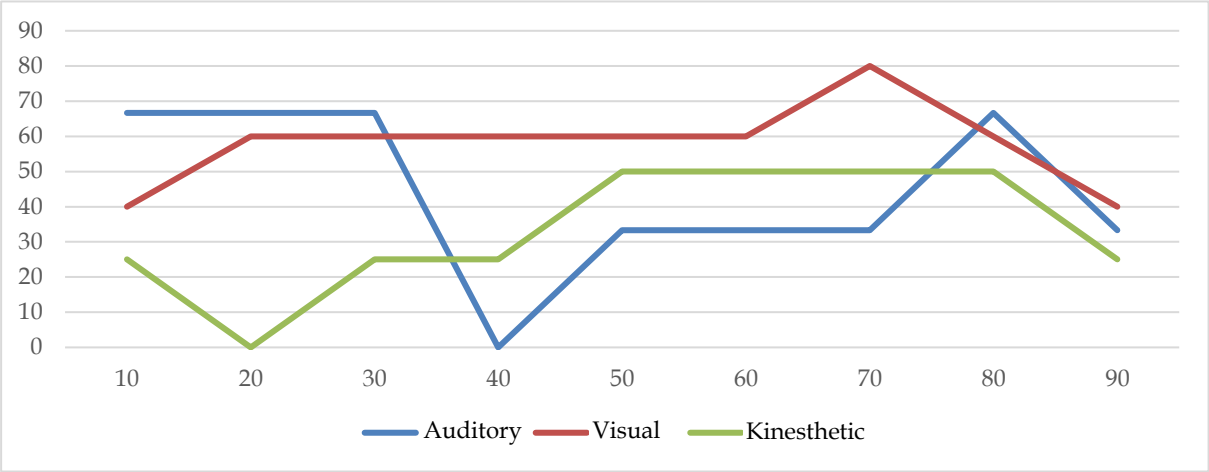

Figure 3.
Student Learning Activities in Cycle I

Learning activities when cycle I actions were carried out, students with visual learning styles tended to remain in the range (40% - 80%), in the first 10 minutes, video visualization attracted the attention of students with visual learning styles. Then in the last 30 minutes showed a decline, after the presentation of the results of group work, learning activities were dominated by explanations from the teacher and responses to arguments from other students. In students with auditory learning abilities in minutes 30-40 there was a significant decline, at that time there was a problem related to the loudspeaker on the laptop which was then assisted by the teacher's explanation without turning off the audio sound. So at that time students were heard with 2 voices at once, and that would interfere with the hearing sensitivity of auditory students (Budiningtyas & Rejeki, 2022). While students with kinesthetic learning styles tended to experience increased learning activities, although in the first 40 minutes they were less active, but in the 50th minute and so on when

the learning media (teaching aids) were removed kinesthetic students were more active and in the last 10 minutes experienced a decline.

Based on the data shown in the graph above, reflection and evaluation were carried out, as well as interpretation of the data obtained. The results of reflection on the actions in cycle I, first electronic devices such as infocus do not support loudspeakers in the classroom, and there are no other electronic devices in the school that can be used. Second, although at the end of the learning process most students are active, at the beginning of the learning process the dominant kinesthetic students do not carry out the expected learning activities, they prefer to chat and rock their chairs while the teacher fixes the sound problem . Then the third result of the reflection on the learning media is less effective when used for grade V students, because the pieces of the teaching aids are too small, so many are lost and the LAS work is incomplete.

Cycle II

Based on the results of reflection and evaluation in cycle I, the plans to be carried out in cycle II are; (1) designing attractive visual delivery media (Ms. Power Point) accompanied by detailed teacher explanations; (2) Integrating learning media and students with kinesthetic learning styles through activities of choosing the right pieces and standing in front of the class; and (3) adjusting the pieces of teaching aids used so that they are not easily damaged or lost and taking into account the ease of students in using the teaching aids. Learning outcomes in cycle II are performing addition and subtraction operations of fractions which are a continuation of the material carried out in cycle I. Similar to cycle I, cycle II also designs learning devices in the form of teaching modules, test instruments, observation sheets and learning media that are adjusted to learning outcomes in cycle II.

When implementing cycle II, students spontaneously formed groups as in previous meetings and they seemed enthusiastic when the learning media was brought into the classroom. So that teachers do not bother to group student learning and teachers can use the time to set up electronic devices for presentations. When the presentation has no significant obstacles, most students are more conducive to paying attention to the presentation visualization and listening to information well, this can be seen from their responses when asked to comment and express their opinions. An interesting thing when the presentation when asking for students' responses to add fractions 1/3 + 1/4, some answered 2/4 and some answered 2/7. When this happens, students are given scaffolding by asking several trigger questions about how many fractions for the small part (red), so that they are able to mention 1/12 and relate it to 1/3 and ¼ in the previous question

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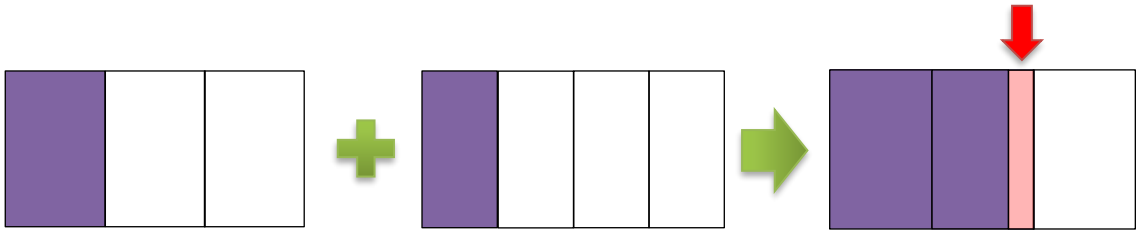

Figure 4.
Illustration of Adding Fractions

However, at the end of the presentation of information (minute 32), several students 3 students began to lose focus by chatting and changing seats. Realizing this, the teacher immediately asked the student to represent his group to take the learning media package to be used. After the learning media was distributed to each complete group, an explanation was not immediately given regarding the learning media, but gave students a few minutes to observe the teaching aids used. This was done because looking at cycle I, when given an explanation directly, students with visual and kinesthetic learning styles focused more on the teaching aids than listening to the rules for using the teaching aids and what to do on the student activity sheet. This action of a few minutes was more successful in directing students to carry out learning activities as in the previous student learning design, this can be seen from their activity sheets being filled in completely. Then when the presentation of the results of the students was also more focused than before, more disciplined when conveying their arguments and the process of changing was faster. This is possible because 2 of the 4 previous meetings had been presented so they knew what to do. At the end of the 5th meeting, a summative was carried out to measure students' numeracy literacy abilities. The results can be seen in the diagram below.

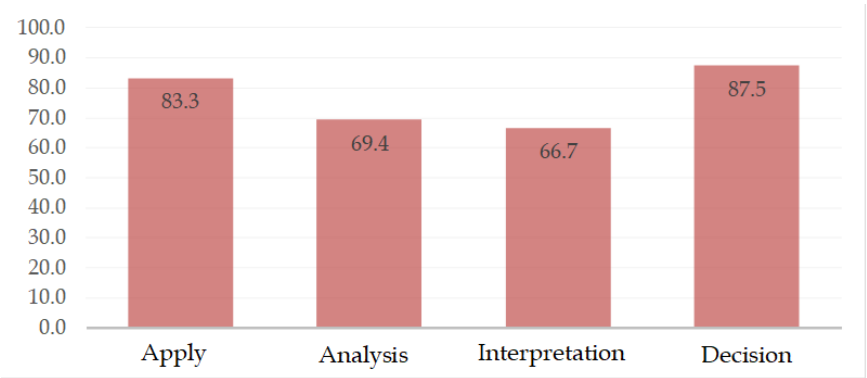

Figure 5.
Presentation of Students' Numeracy Literacy Skills in Cycle II

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When compared to cycle I, students' numeracy literacy skills in cycle II in every aspect increased. The aspect of decision making is the highest aspect (87.5%), followed by the aspect of using mathematical symbols (83.33%), and the lowest score is in the aspect of interpretation/prediction based on the results of the previous analysis. Although efforts have been made by providing learning media in the form of fractional props to reduce the concrete-abstract gap, students still have difficulty when estimating addition or subtraction accurately without doing calculations.

Although there was an increase in learning activities in cycle II to 100%, learning activities in each learning style were more diverse. Students with learning styles tended to experience a rating from minute to minute, although in the first 20 minutes of learning students with this learning style were more passive, and they were active at minutes 40-80 when the fraction addition props were given to students. While for students with auditory and visual learning styles they were more stable, although the visualization of fraction operations with Ms. Power Point and clear explanation of the material, these two learning styles could maintain student learning activities . At minutes 30-50 all three learning styles tended to decrease, this was probably because the level of concentration and focus of students was limited, so that at these minutes students tried to relax to take preparation to tinker with the learning media. The action stopped in cycle II, because two of the four aspects of numeracy literacy had reached 75% and student learning activities also showed stability and improvement for all learning styles. For the aspect of estimating/concluding data, it still needs attention for further research.

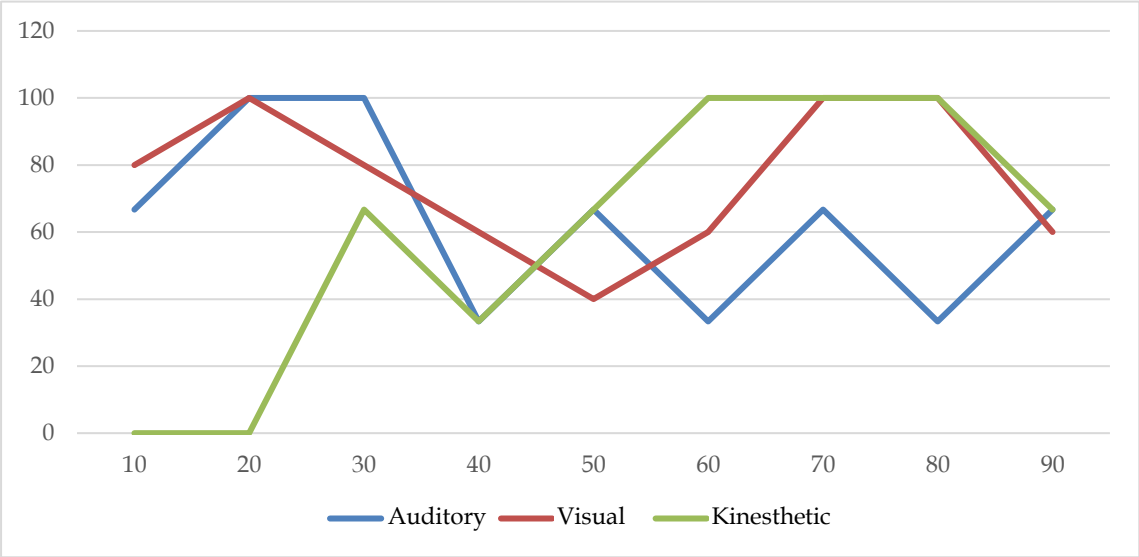

Figure 6.
Student Learning Activities in Cycle II

CONCLUSION

With differentiated learning, the numeracy literacy skills of fifth grade students of SD 067694 have increased in every aspect. Differentiated learning that provides students with the opportunity to argue can train students' ability to draw conclusions. Then the learning media in the form of pieces of paper can train students' ability to write fractions well. Paper pieces of teaching aids can reduce the concrete-abstract gap, but do not have a significant impact on the aspect of estimating/predicting. Then the learning activities of students with an auditory learning style will be disturbed by unwanted sounds, they are more interested in the right narrative. Then students with a kinesthetic learning style are more active when given teaching aids for them to explore. And students with a visual learning style are more consistent during the action.

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