Application of the STAD model assisted by media share board to improve the numerical literacy of grade II students at SD Negeri 3 Jambangan Malang

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Abstract: *The purpose of this study was to determine the application of the STAD model assisted by Shard Board media to improve students' numeracy literacy in class III fraction material at SD Negeri 3 Jambangan, Dampit District. The research used was classroom action research, the research was carried out through two cycles with steps namely Planning, Implementation, Observation, Reflection. Collecting data using research instruments required includes interviews, pretest, test, posttest, observation sheets, documentation. The results showed that the application of the STAD model assisted by Shard Board media was proven to increase students' numeracy literacy. This can be seen through cycle I getting an average of 67.5 and cycle II getting an average of 81.78. Therefore it is necessary to apply the STAD model assisted by Shard Board media when learning in class, so that it can provide variations in the learning process and can improve students' numeracy literacy.*

Keywords: STAD; *Share Board*; Numeracy Literacy

Introduction

Education plays an important role in producing the next generation who are intelligent in changing the world for the better. Education is born well when the state is able to implement a curriculum in accordance with the times (Sari, 2022). The curriculum plays an important role in building education, because the curriculum contains the goals to be obtained as a provision for understanding, behavior and skills so that they are equal to the needs of life in the world (Pertiwi & Renda, 2019).

The challenges of the 21st century can be overcome by requiring Indonesian people to master six basic skills, namely numeracy literacy, scientific literacy, language literacy, financial literacy, digital literacy, and civic cultural literacy. Of the six literacies that are appropriate for making decisions using numbers and mathematical symbols, namely numeracy literacy (Sari, 2022). For example, when we want to save money, go shopping, know height and weight, this requires numeration.

Numerical abilities have a broad influence, not only limited to individuals but also have an impact on the social level so that the mastery of numeracy literacy has a close relationship with the ability to solve mathematical problems (Salvia et al., 2022). Numerical Literacy is a person's understanding and ability to use various types of symbols and numbers related to basic mathematics to solve various everyday problems from various contexts and forms (tables, graphs, sections, etc.) to analyze the information presented in the interpretation of the results of analysis for predict and make decisions (Kemendikbud, 2019). This is in line with Numeracy literacy is defined as a person's ability to use reasoning, through activities in manipulating symbols or mathematical language found in everyday life, and expressing these statements through writing or orally (Ekowati et al., 2019). Therefore, it is not enough for

students to only have knowledge of mathematics, but students must have understanding and be able to identify every problem given in mathematics.

Awareness of the importance of numeracy literacy in everyday life makes numeracy literacy an important component in learning in the school environment, especially in the implementation of teaching which is still not optimal with learning patterns that are still monotonous where the teacher applies the lecture model without any learning aids or media, this is causing students to feel bored and less interested in the material presented (Kurniawati, 2022). According (Kurniawati, 2022) the role of the teacher in the learning process has a very large level of importance because the teacher is an educator, mentor, trainer and curriculum developer who can create an interesting, fun learning atmosphere, provide a sense of security, and provide space for students to think actively, creatively and innovatively. Therefore, teachers must plan carefully in improving the learning process. This includes the use of teaching models and methods, teaching and learning strategies, as well as the attitudes and characteristics of teachers in managing the teaching and learning process (Erwinsyah, 2016).

The reality that occurs in the field of low numeracy literacy can be seen from the results of the midterm exams in mathematics which average 66.78. This is evidenced by the results of observations made on October 5, 2022 to homeroom teachers and students III of SD Negeri 3 Jambangan, Dampit District. The learning models and media used are less varied, the teacher uses lectures with the help of LKS media. Students feel they do not understand the material being taught, students feel bored with models, the learning media they use end up joking, playing alone, this causes the learning process to run less optimally because there are still students who cannot read, write, count.

Based on this phenomenon, numeracy literacy empowerment needs to be implemented which involves the active role of students in learning activities to increase numeracy literacy. One learning model that actively involves the role of students is the STAD learning model which is suitable to be applied to class III fractional material, with this learning model, students have the opportunity to express their thoughts, discuss, and work together with group members when there are friends who are having difficulties (Wulandari, 2022).

The STAD model is one of cooperative learning in which students are formed into study groups consisting of four or five members representing students with different ability levels and genders (Wulandari, 2022). The STAD model emphasizes activities and interactions between students to help each other in mastering subject matter, in order to achieve the expected goals, students are placed in learning teams to work together in groups to complete tasks given by the teacher (Tama et al., 2019). The importance of group division is based on the fact that it is easier for students to find and understand complex concepts when they study the problem together. The advantage of the STAD learning model is that students can become peer tutors to help their groups, students actively provide assistance and provide motivation to achieve common goals in developing their ability to think (Wulandari, 2022). The STAD model can also increase numeracy literacy according to research (Kustantina, 2023)

states that in this study there was an increase in student numeracy after taking action using the STAD learning model with significant improvement results after using the STAD Model.

In addition to using the learning model, researchers also use a Share Board media, namely a fractional board media that can be used for fractional material (Pajarwati et al., 2019). According to (Cahya, 2019) the Media Shard Board or fractional board is a tool created to help teachers convey learning material for fractions in mathematics, on the fractional board there is a circle which in the circle can be filled with various fractions as needed based on the material being taught. teach. This is in line with the opinion of (Listiyaningsih, 2022), a fraction board is a tool designed to assist teachers in conveying fractional material to students so that it is easier to understand. This fraction board can be used for simple fractions, equivalent fractions, comparing and ordering fractions and adding simple fractions. Based on the explanation above, it can be concluded that the Shard Board media or fraction board is a tool for conveying fractional material in mathematics.

This is in line with (Mulyani & Yatri, 2022), the use of fractional board media during the learning process can create an active class situation and increase student understanding. Thus, researchers use the STAD learning model assisted by Shard Board media which is expected to be able to overcome problems in the learning process of class III fraction material so that it can create active learning in increasing numeracy literacy.

Method

This study applies the method of classroom action research (CAR). Classroom action research (PTK) is research that emphasizes the teacher as a facilitator to provide good treatment to students in the form of certain actions that support the process of improving students' abilities and success in several ways, namely: planning, implementing, observing and reflecting on actions in collaboration and contributions with the aim of improving their performance as teachers, so that students' numeracy literacy can increase (Arikunto et al., 2017).
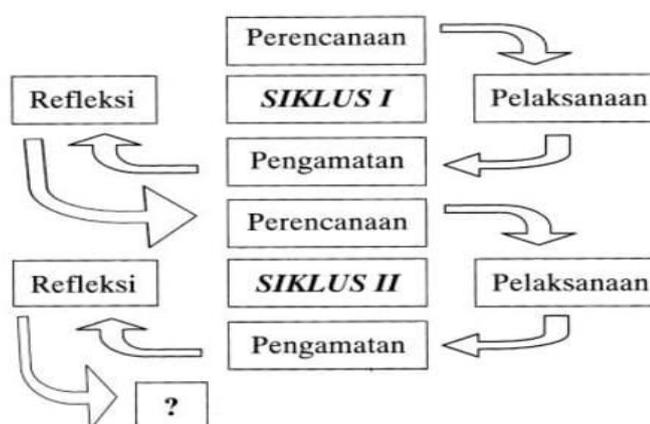

Figure 1. PTK Model Kemmis dan Mc Taggart (Arikunto, et al., 2017)

With the PTK research procedure, it consists of 2 cycles, each cycle of 2 meetings, in each cycle there are several stages that need to be carried out, including:

a) The planning stage (planning) at this stage in cycles I and II the researcher plans to make an action plan to prepare various things needed in implementing classroom action research including. 1). Prepare a Syllabus and Learning Implementation Plan (RPP) regarding fractional material that will be delivered using the STAD model assisted by Shard Board media. 2). Make student worksheets (LKS) which are completed with the group. 3). Encourage students to do the assignments in the book individually. 4). Making instruments that will be used in research in the form of pre test questions, cycle I questions, cycle II questions and post tests. 5). Make teacher and student learning implementation sheets that are used in each learning process.

b) Action stage (action) The action stage is carried out according to the Learning Implementation Plan (RPP) which has been prepared by applying the STAD model assisted by Shard Board media.

c) Observation stage (observation) at this stage the researcher observes and documents the activities that have taken place to determine the suitability of the implementation with the predetermined plan.

d) Phase Reflection (reflection) this stage the researcher can measure the success of a cycle and determine cycle improvement.

This classroom action research was conducted in class III SD Negeri 3 Jambangan Malang. This research was conducted in semester 2 of the 2022/2023 academic year starting from January to February 2023. The subjects of this research were class III students for the 2022/2023 school year in the subject of fractions, with a total of 28 students. Classroom action research using the STAD learning model assisted by Shard Board media on grade III material is declared successful if it meets the minimum completeness criteria (KKM) of 70, and the percentage of students who achieve a numeracy literacy level is 85% of the total number of students. Methods and data collection in the form of interviews, syllabus, Learning Implementation Plans (RPP), tests, observations, instrument validation, and documentation.

The results of students' numeracy literacy mastery were obtained through evaluation using tests in the pre-test, cycle I, cycle II, and post-test stages. The value of the test results is calculated by dividing the number of scores obtained by students by the total score. The success rate of all students in learning can be determined by calculating the average student score after they take the numeracy literacy test. To calculate the proportion of students' numeracy literacy mastery, the following formula is used.

$$P = \frac{\sum Siswa\ tuntas\ belajar}{\sum Siswa} \text{ X } 100$$

(Syarief, 2021)

This analysis process is carried out during the reflection stage. The results of this analysis are used as a basis for planning the next steps in the next cycle. The results of the analysis are also used as material for reflection to improve learning design.

Table 1. Numerical Literacy Complete Achivement Catagory

Category Value	Category
Value 70 ≤ X ≤ 100	Complete
Value 0 ≤ X ≤ 100	Not Completed

Observational data were obtained through observing the activities of teachers and students during the learning process. Observations of teachers and students are used to check the suitability between the planning and implementation of actions carried out by researchers during the learning process takes place in cycle I and cycle II.

Results and Discussion

The implementation of the Shard Board media-assisted STAD model as a whole ran smoothly. This research action was carried out in 2 cycles, each cycle consisting of 2 lessons with the following steps. (1) The teacher makes a class presentation by conveying fractional material that will be discussed using Shard Board media or fraction boards. This media can help students to understand fractional material which initially is abstract in nature to become concrete, this is in line with the opinion of (Listiyaningsih, 2022), a fractional board is a tool designed to assist teachers in conveying fractional material to students so that it is easier to understand. (2) The teacher divides students into small groups consisting of 4-5 people to work on worksheets by discussing with the group and then group representatives come forward by presenting the results of their group work using Shard Board media can help students actively work together, act as peer tutors who have the ability to think so that they are not competitive and do not have a sense of revenge, this is in line with the opinion of (Shoimin, 2014), dividing students into small groups makes students work together as peer tutors to improve the ability to think in achieving learning goals. (3) The teacher gives quizzes to work on questions in the book to work on individually, this is in line with the opinion of (Shoimin, 2014), giving quizzes is done so that students are responsible for themselves in understanding the material that has been taught. (4) The teacher calculates the group progress score, this is in line with the opinion of (Shoimin, 2014), calculating the group progress score is done to provide the goals achieved to be better than before. (5) Giving awards in the form of prizes to groups that have the highest scores, to motivate students to be more active, this is in line with the opinion of (Purwanto, 2011), giving awards aims to be more active in improving what has been achieved.

Implementation of these steps, in the first cycle 89% of the learning activities were in accordance with the lesson plan (RPP) and still had not reached completeness. This could be seen from the students who were less able to work together with their group members because it was the first time using the STAD learning model with Shard Board media. Besides that, students are embarrassed to ask and many students choose to be silent so that their numeracy literacy is low. Cycle II 97.5% of learning activities according to the learning implementation plan (RPP) and student enthusiasm is getting better than the previous cycle, students' understanding of the material presented using the Shard Board media shows an

increase in numeracy literacy so that student scores increase from the previous cycle, in cycle I there was an increase in numeracy literacy results from 9 students (32%) to 17 students (61%) students who completed with an average of 67.5 and in cycle II from 17 students (61%) to 24 students (86%) with an average -average 81.78 completed. Data for this increase can be seen in Figure 2 below.
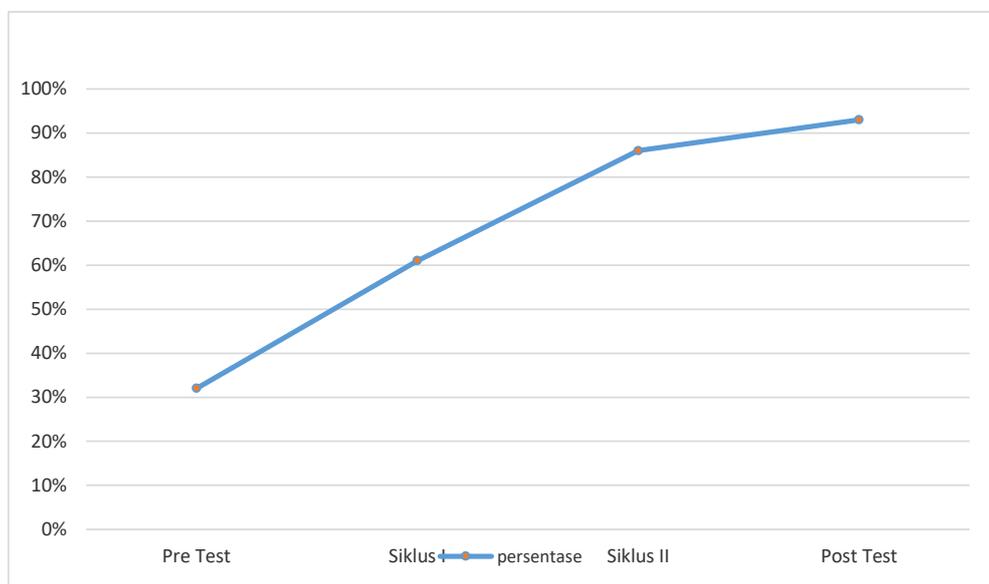

Figure 2. Graph Percentage of Each Cycle

Based on Figure 2 above, it shows an increase in students' numeracy literacy results by 25% in each cycle after applying the STAD model assisted by Shard Board media.

The results of this study are in line with the results of research (Zulfaningrum, 2021), which is that after learning using the STAD (Student Teams Achievement Division) model it can improve students' numeracy skills during the Covid-19 pandemic with an average of 47.2 in each cycle. (Taufikurrahman & Nurhaswinda, 2021), namely the application of fractional board teaching aids can increase understanding of mathematical concepts on the theme of loving plants and animals at SDN 006 Bengkong Batam with an average of 7.5 in each cycle. In addition, this research is also in line with research (Ningsih et al., 2022), namely after the pretest and posttest were carried out, there was an effect of numeracy literacy on mathematics learning outcomes in class III students at SDN Lingkok Five Academic Year 2021/2022 with an average of 37.08 in each cycle.

The advantages of applying the STAD model assisted by Shard Board media include: 1) students actively work together. 2) students act as peer tutors. 3) improve individual opinion skills. 4) not competitive. 5) have no grudges. 6) create a pleasant learning atmosphere so as not to make students feel bored in the learning process and improve numeracy literacy.

The weaknesses of implementing the STAD model assisted by Shard Board media include: 1) it takes a long time. 2) the role of smart students is more dominant. 3) teachers need special abilities. 3) it is expensive to make Shard Board media or shard boards.

Aspects and indicators of research success are (1) Using various numbers and symbols related to basic mathematics to solve problems in various contexts of everyday life. The indicators contained in the pretest and post test questions were 5 questions with an average of 13 students and 25 students who completed this correctly, in addition to this there were 5 questions in the Cycle I test and 6 questions in the second cycle test with an average on average in each cycle there are 13 students and 25 students who answered this question correctly, this is in line with the numeracy literacy indicator according to (Ekowati et al., 2019), which is using various kinds of numbers and symbols related to mathematics to solve problems in various contexts of daily life -day. The indicator data can be seen in Figure 3 below.
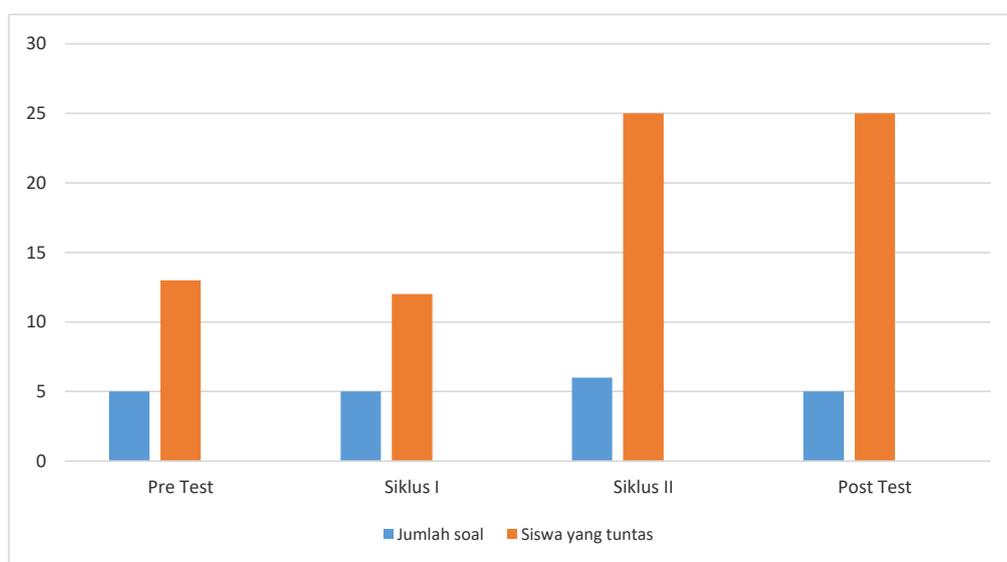

Figure 3. Graph of Completeness Indicators Using Various Numbers and Symbols related to Mathematics

Based on Figure 3 above, it can be seen that there is an increase in students' mastery in solving problems according to these indicators optimally after the teacher explains fractional material using the Shard Board media so that students more easily understand numbers and symbols in fractional material, this is in line with research (Taufikurrahman & Nurhaswinda, 2021) that is by applying the media of fractional board teaching aids can improve understanding of mathematical concepts on the theme of loving plants and animals SDN 006 Bengkong Batam with an average of 7.5 in each cycle.

(2) Analyze the information presented in the form (graphs, tables, sections, diagrams and so on). This indicator is found in the pretest and posttest questions of 3 questions with an average of 16 students and 21 students who answered this question correctly. In addition, this question contained 2 questions in the first cycle test and 2 questions in the second cycle test with an average of 19 students in each cycle who answered this question correctly. This is in line with the numeracy literacy indicators according to (Ekowati et al., 2019), namely analyzing information displayed in various forms (graphs, tables, sections, diagrams and so on). The indicator data can be seen in Figure 4 below.
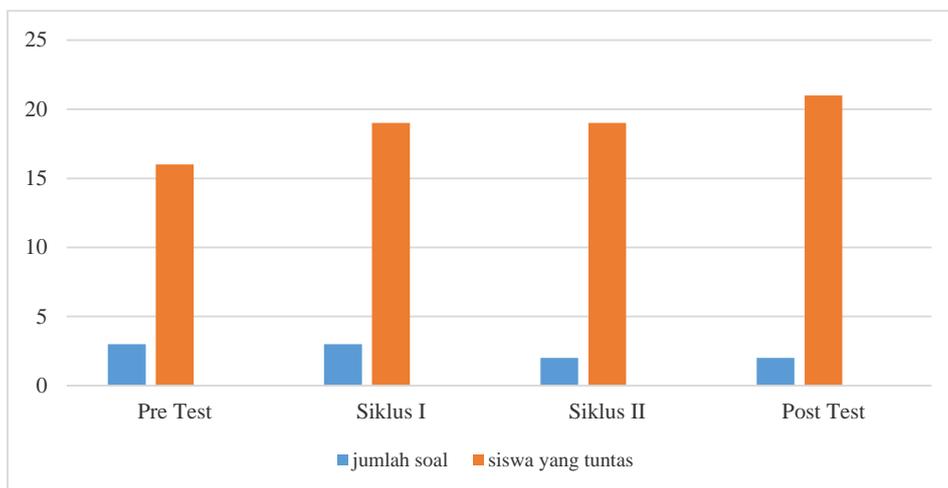
Figure 4. Graph of Completeness Indicators Analyze the information displayed in the form (graphs, tables, sections, diagrams and so on)

Based on Figure 4 above, it can be seen that there is an increase in students' mastery in solving problems according to these indicators optimally, after the teacher divides students into small groups consisting of 4-5 people and gives worksheets that are worked on with the group students become active in discussing in solving analysis questions the. According to research (Rokhanah et al., 2021), the STAD model can increase the learning activity of fifth grade students at SD Negeri 3 Sidoluhur for the 2020/2021 academic year.

(3) Interpret the results of the analysis to predict and make decisions. This indicator is found in the pretest and posttest questions as many as 2 questions with an average of 17 students and 19 students who answered this question correctly besides that, this problem is found in cycle I questions as many as 3 questions and cycle II test questions as many as 2 questions with an average on average in each cycle there are 20 students and 21 students who answered this question correctly. This is in line with the numeracy literacy indicators according to (Ekowati et al., 2019), namely interpreting the results of the analysis to predict and make decisions. The indicator data can be seen in Figure 5 below.
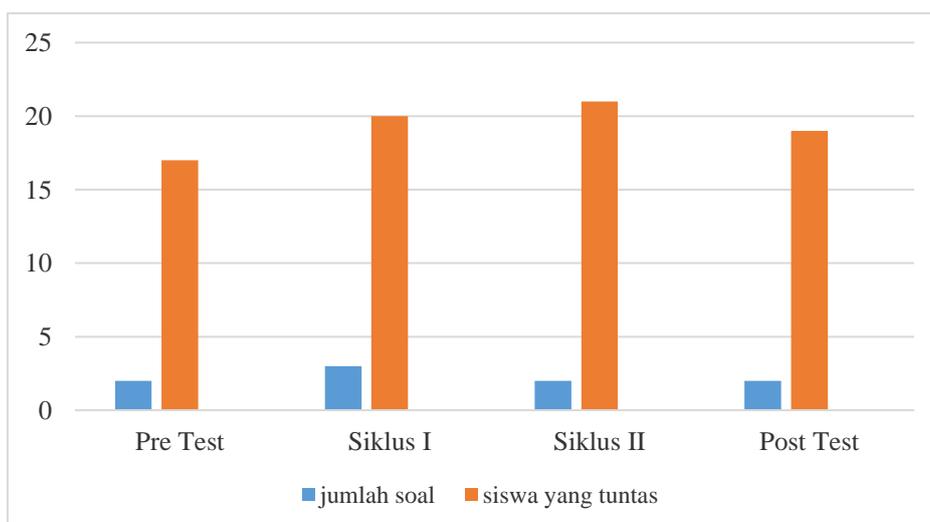

Figure 5. Graph Interpreting the results of the analysis to predict and make decisions

Based on Figure 5 above, it can be seen that there is an increase in student mastery in solving problems according to these indicators optimally, after the teacher applies the STAD model assisted by Shard Board media students are divided into groups consisting of 4-5 people to work on group LKS and advanced group representatives presenting the results of the discussion using the Shard Board media, this makes it easier for students to interpret the results of the analysis to predict and make decisions in these questions which are initially abstract in nature to become concrete, easier for students to understand so that learning objectives can be increased. According to (Pertiwi & Renda, 2019), the application of the STAD model with concrete object media can improve the learning of fractions for fourth grade elementary school students

Conclusion

The application of the STAD model assisted by Shard Board media can improve students' numeracy literacy in class III fraction material at SD Negeri 3 Jambangan, Dampit District. Cycle I, the percentage of teacher and student activity reached 89% and the percentage of completeness reached 61% with a class average of 67.5, while in cycle II there was an increase with the percentage of teacher and student activity reaching 97.5% and the percentage of completeness level reaching 86% with an average -class rats of 81.00. This shows that there is a comparison between cycle I and cycle II which increases optimally by 25%.

Suggestions from researchers include; 1). It is hoped that schools can apply the STAD model assisted by Shard Board media to Class III fraction material, so that it can provide variations in the learning process in the classroom, as well as increase students' numeracy literacy in Class III fraction material. 2). For teachers of learning activities, it is expected to use existing learning models with the assistance of learning media, one of which is by using the STAD model assisted by Shard Board media which can train students in teamwork, making students more aware of the material being taught so that the results of students' numeracy literacy in class III fraction material can be increased. 3). For students, it is hoped that students can pay more attention to the material taught by the teacher and be able to improve their numeracy literacy results in class III fractional material. 4). For other researchers, they can use the results of this study as a study to conduct further research regarding the application of the STAD model assisted by Shard Board media to improve students' numeracy literacy in class III fraction material.

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