
Improvement the Results of the Minimum Competency Assessment (MCA) Literacy and Numeracy Class V SDN Pulogadung District

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Abstract

The research is motivated by the low literacy and numeracy ability of elementary school students in Indonesia, the purpose of this research is to determine the improvement of literacy and numeracy skills in grade V students at SDN Pulogadung 07 through the application of the Minimum Competency Assessment (MCA) instrument. The method used in this study is quantitative descriptive with a one group pretest - posttest design involving 30 students, the data is collected through the AKM test and then analyzed using the Gain test. The results showed an increase in literacy ability by 0.179 and numeracy ability by 0.379, the increase in literacy was in the low category while the increase in numeracy was in the medium category. These findings show that the implementation of MCA - based learning is effective in improving the literacy and numeracy skills of students at SDN Pulogadung 07.

Keywords: literacy, numeracy, MCA (Minimum Competency Assessment).

1. Introduction

(Media Literasi Sains, 2021) explained that the definition of literacy is the ability that individuals have to read, write, be able to understand something, be able to interpret something, be able to use clear and good language, and be able to think critically. In Indonesia, the context of literacy is very necessary from an early age. Where literacy also involves something related to text comprehension, communication (language skills). In addition, literacy is defined as critical skills that can be applied to daily life, both in understanding texts and communicating. The main goal of literacy in education is to ensure whether students have basic skills and are able to do so in daily activities.

Meanwhile, the definition of numeracy is the ability of individuals to interpret, manage data, and formulate in a mathematical context. In addition, numeracy is able to understand concepts, procedures, mathematical tools used, and mathematical facts in daily life. Mathematics is not only able to understand, use numbers in various situations but is able to involve a basic understanding

of arithmetic operations and is able to solve mathematical problems in the context of daily life. Numeracy skills at the elementary school level are very important, because they are able to support logical thinking in students and have skills in student problem solving (Ekowati & Suwandayani, 2018).

Literacy and numeracy have differences, where literacy is more emphasized on words and language, these two things are the basic elements and indicators of a person's improvement in exploring (Muhammad Luqman, 2024). Meanwhile, numeracy is the skill of generalizing every mathematical concept and rule in the daily life of (Kumparan, 2023).

Therefore, to find out how students' literacy and numeracy skills develop, it is important to examine the results of large-scale international assessments such as the Programme for International Student Assessment (PISA), which assesses students' competencies in the field of literacy and numeracy. In 2018 the literacy and numeracy results in Indonesia were in the bottom 10 out of 79 countries participating in PISA 2018, according to the results of PISA 2018 released by the OECD, students' ability in reading (literacy) adapted a score of 371 and the result of students' ability score in mathematics (numeracy) was 379. There are several factors that cause low literacy and numeracy scores in Indonesia, namely internal factors about student learning motivation, competitive traits that students have. In addition, the external factors experienced are the difference in the learning environment at home and at school, the learning practices carried out by teachers, and the completeness of the facilities needed for learning. These factors are known through school questionnaires (Nur'aini et al., 2021; OECD, 2019)

In 2022, the PISA score results were lower than the results in the 2018 PISA, but Indonesia experienced an increase in the ranking released by the OECD. (Kemendikbudristek, 2023) explained that literacy has experienced 5 position increases from before and numeracy also experienced 5 position increases from before. Factors that make the increase in literacy and numeracy scores increase is teacher training that has been provided by the Ministry of Education and Culture through the Independent Teaching Platform accompanied by online and hybrid learning materials.

SDN Pulogadung 07 in Pulogadung sub-district has poor literacy and numeracy conditions, because there are still many students who do not understand counting and read fluently. This is known when the author presents the materials that the author teaches, where many students in grade V do not know what material is being discussed. One of the materials that the author teaches is flat building, in grade V it should be easy to know the formula and calculate on the material, because from the second grade of elementary school students have learned multiplication and division. Class V students who should have mastered the material and are very able to do the final exam in class VI, but the class V students do not seem to have prepared to take the final test at the final elementary level. There are still many students who are not fluent in reading and often have difficulties. When asked to read and understand texts quickly, this shows that students' literacy skills are still limited and this affects their ability to complete academic tasks effectively. Therefore, knowledge of literacy and numeracy skills is very important to prepare students to achieve the expected learning competencies at the elementary level.

Learning difficulties are conditions where students cannot achieve competencies or achievements according to the set standard criteria. The factors of student learning difficulties are divided into 2 namely (Ratnawati, 2017)

1. Internal factors, factors that come from themselves
2. External factors, namely factors that come from outside of oneself.

In this study, the author succeeded in asking what factors affect and many of them have difficulty grasping learning, many students answered that it is because they themselves are ignorant of learning, many of them after learning do not repeat learning.

The library, which is a means of literacy and numeracy, has a messy condition due to the movement of rooms from the first floor to the second floor, the move occurred because the library placed on the first floor was flooded and many books were destroyed by the flood. In addition to teaching, students also help tidy up books according to their categories and clean the library every day. Due to the condition of the library that is not completely perfect, only some students are allowed to use the library such as students in grades I and II who already have a schedule once a week.

In helping to improve student literacy and numeracy, the government has created a Teaching Campus (TC) program. The Teaching Campus is part of the Freedom of Learning policy, where students have the opportunity to take programs outside of the main course, such as internships or the development of multidisciplinary projects that are relevant to industry or society. The Teaching Campus Program is teaching in schools intended for all students (Shabrina, 2022). This Independent Campus policy aims to produce graduates of students who are skilled and ready to work, not only with students but also the principles of the Independent Campus applied at the primary and secondary education levels also aim to graduate students in the development of basic competencies, such as literacy and numeracy that are useful for the next level of education. Students who take part in TC are able to improve their competence by making a real contribution to the community, which will shape the character of students. Students who are placed in the school of choice also become collaboration partners of teachers at the school. (Simatupang & Euhertiana , 2021; Wulandari et al., 2023)

MCA is an important part to ensure that students already have strong basic competencies in literacy and numeracy, besides that MCA also aims to improve the quality of student learning, what TC students do is to create programs (work programs) that are able to improve students' basic competencies. MCA is a tool to obtain information related to students' success in mastering the material (Rohim, 2021). MCA was carried out twice, the first MCA on March 18, 2024 with two sessions, namely the morning and afternoon sessions, the second MCA was held on May 30-31, 2024. The author uses the results of the AKM for the author's research and to see if there is an improvement in the results of the AKM and whether the work program carried out by the author can improve the results of the MCA or not while participating in the MCA.

In order to achieve an increase in MCA results, TC 7 students at SDN Pulogadung 07 made several work programs, including reading 15 minutes before starting the subject, creating a study group, choosing a favorite book, memorizing formulas per day, asking and answering math problems, group discussions about mathematics in daily life. There are several work programs that

are carried out outside the classroom and are also useful for students such as waste selection, educational games, learning about violence in the school scope.

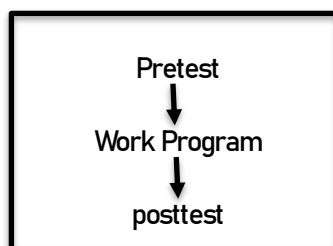
The materials that the author teaches on literacy are materials in subject books such as Indonesian, PPKN, Cultural Arts. In literacy activities, the author asks students to read and be able to understand what reading they read, the author asks students to reexplain what they read and what things students can take from the reading, besides that students also make dramas from the readings they read. During the division of groups, the author makes groups randomly so that there is no favoritism towards each other, so that they can discuss with friends who rarely communicate even though they are in class.

In Numeracy, as explained above, the author teaches flat figures, space figures, fractional numbers. Because many students in grade V do not understand multiplication and division where multiplication and division material is important for every other mathematics material, the author re-teaches multiplication and division to students at SDN Pulogadung 07. The author and other TC members made a snake and ladder game to learn the literacy and numeracy materials that have been taught, where in the game students are divided into several groups and given questions, who can answer, then they can throw their dice.

2. Methods

The research method used is quantitative descriptive, this method is appropriate to evaluate the development of literacy and numeracy skills of students of SDN Pulogaung 07. The purpose of this study is to assess student competency based on the MCA (Minimum Competency Assessment) test. This type of research has the purpose of describing and analyzing the improvement of literacy and numeracy skills of students of SDN Pulogadung 07. In this study, it consisted of 30 students in class V who were the subjects of the research. The research design used a one-group pretest–posttest, where the same group of students participated in both tests. The pretests – posttests were able to help the author see if there was an increase in the results of the MCA literacy and numeracy of students.

Figure 1.
Research Design



The 20 MCA multiple-choice questions on literacy and numeracy are research instruments, where these questions are able to measure the literacy and numeracy skills that students have. Literacy questions include text discussion, analysis, interpretation, while numeracy measures

students' ability in simple arithmetic operations, patterns, and problem solving.(Sani, 2021). The validation and reliability of the AKM instrument is ensured by the Ministry of Education and Culture which is part of the assessment system, therefore the researcher only uses the official link provided by the government.

The collection of MCA data results is carried out in two stages, the initial stage aims to get an overview of students' basic literacy and numeracy skills, the final stage is taken after students get learning interventions about literacy and numeracy (Kemendikbud, 2020). Data were analyzed using descriptive statistics, including mean, median, mode, and standard deviation, to illustrate the distribution and improvement of student scores. The gain score (N-Gain) was then calculated to determine the effectiveness of the intervention in improving students' literacy and numeracy. (Vivi Silvia, 2020), explained that descriptive statistics is a method of data management, analyzing numbers in the form of tables and graphs and being able to interpret them with conclusions. The following are the formulas that will be used.

Table 1.
Formula used in Research

Formula Name	Formula	Description
Mean Formula	$\bar{X} = \frac{\sum x}{N}$	Where \bar{X} represents the average score and N is the total number of students.
Median Formula	$M_d = \frac{N + 1}{2}$	Used to determine the middle value of the dataset.
Mode Formula		The most frequently occurring score in the data set.
Max value :		highest value
Min value		Lowest Value
Standard Deviation (SD)	$SD = \sqrt{\frac{\sum(X - \bar{X})^2}{N}}$	Used to measure the spread of variability of students score.

After obtaining a descriptive picture, to find out more about the increase in MCA results, a gain test will be carried out with the aim of evaluating effectiveness, the gain test also focuses on improvement and not only on the final result. The following are the formulas that will be used in the Gain test (Sukarelawan et al., 2024).

The title of the paper should appear on the top edge of the first page of the document. Type the title in uppercase and lowercase letters, align left margin and in Times New Roman 16-point, boldface type. Capitalize the first letter of nouns, pronouns, verbs, adjectives, and adverbs; do not capitalize articles, coordinate conjunctions, or prepositions, unless the title begins with such a word. In case the title is two or more lines, single-space between the lines. Insert a blank single-spaced line after the title.

$$G = \frac{S_{akhir} - S_{awal}}{S_{maks} - S_{awal}}$$

$$ER = \frac{G_{numerasi}}{G_{literasi}}$$

Categories used in the Gain test

1. High = $G \geq 0.7$
2. Medium = $0.3 \leq G < 0.7$
3. Low = $G < 0.3$

Data analysis also includes a comparison of the initial and final assessments that can determine the improvement of students' literacy and numeracy skills, where the difference in the average score of the beginning and end of the MCA can be used as an indicator of the success of the work program carried out by KM students. A significant increase showed that learning interventions had a positive impact on the final outcome of the MCA.

3. Result and Discussion

3.1. Results

The table below will present the result of the pretest and posttest literacy and numeracy skills of grade V students of SDN Pulogadung 07.

Table 2.
students pretest and posttest literacy scores

NO	Grade V students	Pretest scores	Post-test scores
1	Student 01	35	30
2	Student 02	50	50
3	Student 03	50	50
4	Student 04	60	50
5	Student 05	70	65
6	Student 06	70	65
7	Student 07	70	65
8	Student 08	70	70
9	Student 09	70	70
10	Student 10	70	70

11	Student 11	75	70
12	Student 12	75	70
13	Student 13	75	75
14	Student 14	75	75
15	Student 15	75	80
16	Student 16	75	80
17	Student 17	75	80
18	Student 18	75	85
19	Student 19	80	85
20	Student 20	80	85
21	Student 21	80	85
22	Student 22	80	85
23	Student 23	85	85
24	Student 24	85	90
25	Student 25	85	90
26	Student 26	85	90
27	Student 27	85	95
28	Student 28	85	95
29	Student 29	90	100
30	Student 39	100	100

In the table above, it is shown that most students experience an increase in literacy scores after the intervention, but the scores of some students remain the same or decrease slightly, which shows a varied increase between students.

Pretest Results

$$\text{Mean Score : } \bar{X}_{pretest} = \frac{\sum X}{N} = \frac{2260}{30} = 75,33$$

$$\text{Median Score : } M_d = \frac{75+75}{2} = 75$$

Mode Score : 75

Max Score : 100

Min Score : 35

$$\text{SD : } \sqrt{\frac{5386,0}{30-1}} = \sqrt{185,72} = 13,64$$

Posttest Results

$$\text{Mean Score : } \bar{X}_{posttest} = \frac{\sum X}{N} = \frac{2285}{30} = 76.16$$

$$\text{Median Score : } M_d = \frac{80+80}{2} = 80$$

Mode Score : 85

Max Score 100

Min Score : 30

$$SD : \sqrt{\frac{7684,16666}{30-1}} = \sqrt{265,3161} = 16,28$$

Table 3.

Results of Descriptive Statistics Analysis of Pretest and Posttest Scores

Statistics	Pretest	Posttest
Mean	75.33	76.16
Median	75	80
Mode	75	85
Max	100	100
Min	35	30
SD	13,64	16.28

From the calculations obtained using descriptive statistics that,

- There was an increase in the average score in the pretest and posttest literacy, from 75.33 to 76.16. This shows that the literacy performance of students increases after learning interventions.
- The minimum score of the pretest and posttest decreased slightly from 35 to 30, although most students experienced an improvement, but some students showed lower performance on the pretest.
- At the standard deviation, the score increased from 13.64 to 16.28, indicating that the posttest score was more widely distributed than the pretest.

From the explanation above, it can be concluded that there was an improvement in students' overall literacy skills after the intervention, although the variation in scores between students was slightly larger. However, this shows that the learning programs implemented are generally effective and able to improve the literacy skills of students.

Table 4.

students pretest and posttest numeracy scores

NO	Grade V Student	Pretest Score	Post-test Score
1	Student 01	25	30
2	Student 02	30	40
3	Student 03	40	50
4	Student 04	40	50
5	Student 05	40	50
6	Student 06	40	50
7	Student 07	45	55
8	Student 08	45	60
9	Student 09	45	60

10	Student 10	45	60
11	Student 11	50	65
12	Student 12	55	65
13	Student 13	55	65
14	Student 14	60	65
15	Student 15	60	65
16	Student 16	60	65
17	Student 17	60	65
18	Student 18	60	65
19	Student 19	60	70
20	Student 20	65	70
21	Student 21	65	70
22	Student 22	70	70
23	Student 23	70	70
24	Student 24	70	70
25	Student 25	70	70
26	Student 26	70	70
27	Student 27	70	75
28	Student 28	75	80
29	Student 29	80	80
30	Student 30	80	85

Pretest Result :

$$\text{Mean Score : } \bar{X}_{pretest} = \frac{\sum X}{N} = \frac{1700}{30} = 56,67$$

$$\text{Median Score : } M_d = \frac{60+60}{2} = 60$$

Mode Score : 60, 70

Max Score : 80

Min Score : 25

$$\text{SD : } \sqrt{\frac{6108,67}{30-1}} = \sqrt{210,64} = 14.52$$

Posttest Results

$$\text{Mean Score : } \bar{X}_{posttest} = \frac{\sum X}{N} = \frac{1915}{30} = 63.83$$

$$\text{Median Score : } M_d = \frac{65+65}{2} = 65$$

Mode Score : 65, 70

Max Score 85

Min Score : 30

$$\text{SD : } \sqrt{\frac{4888,07}{30-1}} = \sqrt{168,55} = 12.98$$

Table 5 :

Results of Descriptive Statistics Analysis of Pretest and Posttest Scores

Statistics	Pretest	Posttest
Mean	56.67	63.83
Median	60	65
Mode	60, 70	65, 70
Max	80	85
Min	25	30
SD	14,52	12.98

From the calculations obtained using descriptive statistics that,

- There was an increase in the average score in the pretest and posttest literacy, from 56.67 to 63.38. This shows that the literacy performance of students increases after learning interventions.
- There was also an increase in the minimum score of pretest and posttest numeracy from 25 to 30.
- At the standard deviation, the score decreased from 14.53 to 12.98, which shows that students' scores have become more consistent and less varied.

This shows that the learning program implemented is generally effective and able to improve the numeracy skills of students.

After conducting a descriptive statistical analysis test, it will be followed by the calculation of the normalized reinforcement test (N-Gain), with the aim of seeing the categories of literacy and numeracy score improvement.

⇒ Calculating Normalized Gain

$$G = \frac{S_{akhir} - S_{awal}}{S_{maks} - S_{awal}}$$

- Gain in literacy

$$G_{literacy} = \frac{2285-2260}{2400-2260} = \frac{25}{140} = 0,179$$

- Gain on numerization

$$G_{numeracy} = \frac{1915-1700}{2400-1700} = \frac{215}{700} = 0,307$$

⇒ Calculating Relative Efectivity

$$ER = \frac{G_{numerasi}}{G_{literasi}}$$

$$ER = \frac{0,307}{0,179} = 1,72$$

Where, numeracy is 72% more effective than literacy.

4. Conclusion

4.1. Results of Literacy:

There was an increase in the average score from 75.33 (pretest) to 76.17 (posttest), resulting in an N-Gain value of 0.179, which is included in the low category. Despite improvements in results, learning methods such as individual reading and group discussions were less effective. Therefore, further development and approaches such as a project-based approach are needed.

4.2. Results on Numeracy :

There was an increase in the average score from 56.67 (pretest) to 63.83 (posttest) and resulted in an N-Gain value of 0.307, included in the intermediate category. This shows that the learning approach carried out has proven to be effective and able to improve students' learning abilities. However, to achieve higher levels of improvement, it is necessary to integrate more context-based activities and problem-solving that encourage critical and analytical thinking. However, in order to be able to achieve a high category Gain score, it is necessary to add context-based questions and further train students' more critical thinking skills.

4.3. Limitation

Because only given one semester, the author only provides a quick and easy-to-understand work program, the author also does not devote much more time to students who want to study outside of school hours. From this, the researcher only holds a few classes for deeper lessons. Future studies should involve a longer implementation period and larger sample sizes to gain more comprehensive results. Researchers are also encouraged to explore the impact of integrating technology and project-based learning models to further improve students' literacy and numeracy achievement.

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