STUDENT COMMUNICATION IN NUMERIC LITERATIONS USING CANADIAN MULTIPLICATION MEDIA

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DOI: https://doi.org/10.21107/literasinusantara.v1n1.091104
Received: October 4, 2020
Revised: October 11, 2020
Accepted: November 28, 2020

Abstract

The purpose of this study was to determine the extent to which students' communication skills on numerical literacy in multiplying two numbers using Canadian Multiplication media. This research method is descriptive research. From the planning, implementation, and reporting stages it is carried out for 3 months. Starting from the beginning of August to the second Sunday of November 2017. The implementation of this research was conducted with the subject of second grade students of SD Negeri Medalem Kec. Modo Kab. Lamongan, amounting to 3 students on Wednesday, November 8, 2017. Result the average communication ability of students is 79.2% while the average numerical literacy ability of grade 2 SD Negeri Medalem Kec. Modo Kab. Lamongan in the competency of multiplying two numbers shows 86.7%. Canadian Multiplication Media is an effort as a form of teacher innovation in learning to develop student communication through numerical literacy activities.

Keywords – *Student Communication, Numeric Literations, Canadian Multiplication Media*

1. Introduction

Content Standards for Mathematics Subjects (Permendiknas No 22 of 2006) for all levels of basic education states that one of the objectives of Mathematics in schools is for students to be able to communicate ideas with symbols, tables, diagrams, or other media to clarify a situation or problem.

The embodiment of the meaning of the objectives of the Mathematics subject requires an adequate understanding of the characteristics of Mathematics as an intermediary in studying Mathematics competencies in the Content Standards. The reality in schools, according to Sobel & Maletsky (1999) that so far, many teachers in teaching Mathematics use lesson time by discussing assignments and giving new lessons and then giving assignments to students. Therefore, it is not surprising when Mathematics becomes difficult to understand.

Based on the research of Utari, Suryadi, Rukmana, Dasari, and Suhendra (in Suryadi: 2008) which were carried out in grades 3, 5, and 6 of elementary schools, it is obtained an overview that Mathematics learning is still taking place traditionally which, among others, has the following characteristics. Learning is more teacher-centered; the approach used is more expository; teachers dominate the classroom activity process; and the exercises given are more routine in nature; and students are more passive in the learning process. This condition is not much different from the teaching conditions in SD Negeri Medalem Kec. Modo Kab. Lamongan. This has implications for the lack of competence knowledge of students in integer operations so that students still have difficulty solving problems related to multiplication material.

One of the Mathematics competency standards in KTSP for Elementary School level is "Multiplication and division of numbers up to two numbers" with the basic competency of "Doing multiplication, the result is two numbers". The purpose of the basic competencies above is for students to communicate multiplication into problem solving. However, there are still students of SD Negeri Medalem Kec. Modo Kab. Lamongan, which has not mastered the multiplication of two numbers. Therefore an interesting media is needed that can

be used by students in learning Mathematics so that the learning process is enjoyable.

The purpose of this study was to determine the extent to which students' communication skills on numerical literacy in multiplying two numbers using Canadian Multiplication media.

1. Communication

Guerreiro (2008) states that Mathematical communication is a tool in the transmission of Mathematical knowledge or as a foundation in building Mathematical knowledge. Communication enables mathematical thinking so that it can be observed and therefore communication facilitates the development of thinking. In addition, mathematics communication is one component of the "process of solving mathematical problems". Communication is the ability to use the language of Mathematics to express Mathematical ideas and opinions appropriately, concisely and logically. Communication helps students develop their understanding of Mathematics and sharpen their mathematical thinking.

Schoen, Bean, and Ziebarth (Hulukati, 2005: 18) explain that mathematics communication is the student's ability to explain an algorithm in a unique way to solve problems, the student's ability to construct and explain a presentation of real-world phenomena in graphs, words / sentences, equations , tables, and presentations physically or the student's ability to give guesswork about geometric drawings.

Marhaeni (2009) states that verbal communication is communication that uses verbal words that are consciously carried out by humans to relate to other humans.

Mathematical communication, if associated with the objectives of Mathematics subjects, can be summarized by the statement that Mathematics communication is communication of ideas using reasoning in problem solving by paying attention to Mathematical concepts in order to have an attitude of appreciating the usefulness of Mathematics in real life.

2. Numeric Literacy

According to the NCES (in De Lange, 2006) numerical literacy is the knowledge and skills required to apply arithmetic operations, either alone or sequentially, by using numbers embedded in printed material (for example balancing a checkbook or filling out an order form). A broader definition such as in the ILSS (in De Lange, 2000) that numerical literacy is a collection of skills, knowledge, beliefs, dispositions, habits of mind, communication abilities, and problem solving skills that people need to engage effectively in quantitative situations. arise in life and work.

In simple language, numerical literacy is a process of knowledge or skills that applies arithmetic operations, in this case the multiplication operation of two integers which explores students' communication skills that are useful in problem solving.

3. Canadian Multiplication Media

Canadian Multiplication Media (Sutarto, 2010) is a simple board media in which there are two tables, namely table 1 of the multiplication of numbers 1 to 9 and table 2 of numbers 1 to 9. How to play this media requires 2 or more players. Through Canadian Multiplication media which is applied through the game method it is expected to be able to make Mathematics learning multiplication material fun learning for students so as to support the achievement of learning objectives that can improve learning outcomes.

4. Forms of Innovation

The form of innovation carried out in this study was to modify the Canadian Multiplication media that had been previously developed by Hadi Sutarto. The game equipment required is as follows.

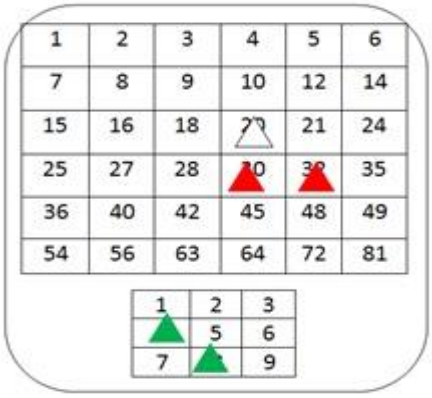
a. Canadian Multiplication Board

b. 2 player pieces (depending on the number of players, for example 2 players)

c. 36 stars consisting of 2 different colors

The full Canadian Multiplication Media modification is presented in the following table.

Table 1. Differences in appearance and rules of the Canadian multiplication medium

Modified Multiplication Media\	Existing Multiplication Media
Display	
Figure 1. Initial Multiplication Views of Canadian Media (2010) 	
 **Figure 2.Media Modification (2017)**	 **Figure 3.Media Before (2014)**
Rule of the game	
1. The players decide between them to move first. 2. The player who steps first places his pawn (for example the first player with a red pawn and the second player with a blue pawn) in one of the squares in table 1-9. Suppose it is placed in box number 5. 3. Then the second player places the blue pawn in one of the boxes in table 1-9.	1. The players decide between them to move first. 2. The player who steps first places a blue and pink star on the 1 to 9 number board, and places a green or yellow star according to the color of the originally selected star on the multiplication board according to the product of the two numbers selected. For example, 1 and 3, the

Suppose it is placed in box number 6. 4. The multiplication of 5 x 6 is obtained from the two players 5. The first player then answers the question by placing a star on the multiplication result table (large table). Suppose that in box 30. 6. Then the second player places his piece in one of the boxes in table 1-9. Followed by the first player placing his piece in one of the boxes in table 1-9 then the second player answers the question by placing a star in the multiplication table (large table). 7. Players are given a duration of time to answer questions for 20 seconds. 8. If one of the players is in turn to answer but cannot answer correctly or give up, then the player's opponent may answer. 9. Performed repeatedly until finally a winner is determined. The winner is the player who puts the most stars in the 1 multiplication table first.	product is 3 3. The second player may only move one blue or pink star at the desired number. For example the second player chooses a pink star, then he moves the pink star from number 3 to number 5, so that now the star triangle is at numbers 1 and 5, the result is 5. The second player places a yellow star on the number 5 on the Multiplication Result Table 4.The first player again gets a turn to run the blue star, which is to move the blue star on number 1 to number 2, so that it becomes 2 × 5, the result of the multiplication of 10, and puts a green star on number 10. then the second player gets a turn and will take turns until someone win 5. The winner is the student who can arrange 4 stars consecutively for the first time, either horizontally, vertically or diagonally. (in Lima: 2014)

In summary, the differences between the Canadian Multiplication Media developed in this study and the previous ones are.

a. Display Design

The design developed uses images of national culture in the hope that students will know and love Indonesian culture. The display design is made using Corel Draw Software.

b. Rules

The rules of the game in this innovation are made more concise so that they are better understood by children which is an improvement than before.

The advantages of this media are relatively affordable manufacturing costs, can be produced in a short and easy time, attractive designs for students, and can form a positive attitude in students, which can foster honesty,

meticulousness and thoroughness, an attitude of responsibility, foster students' spirit in competition , an attitude of self-confidence and not giving up easily, as well as an attitude of respect for opinions and democracy.

2. Method

This research method is descriptive research. From the planning, implementation, and reporting stages it is carried out for 3 months. Starting from the beginning of August to the second Sunday of November 2017. Even though the implementation of this research is one meeting.

Data collection tools used in this research are:

a. Video

Video is used to determine the process of implementing the whole learning recorded by fellow teachers.

b. Photo

Photos are used to document activities during the learning process.

c. Student Daily Journal

Journals are used to record important things during the learning process

d. Unstructured Interview

Used to determine student responses after the implementation of learning

e. Observation Sheet Instruments Student Communication Observations

The instrument is used to determine dakomunication carried out by students during the learning process.

3. Result and Discussion

The implementation of this research was conducted with the subject of second grade students of SD Negeri Medalem Kec. Modo Kab. Lamongan, amounting to 3 students on Wednesday, November 8, 2017.

The following is documentation of the implementation of learning.

Figure 4. Media Introduction to Students

Figure 5. Teacher Demonstrating the Use of Media

Figure 6. Teacher Conducts Guidance

Figure 7. Students Using Media

Figure 8. Awards Between Students

The research results are shown in the following table.

Table 2. Results of Numeric Literacy

No	Name	Perhitungan Siswa									
		1	2	3	4	5	6	7	8	9	10
1	Maya	B	B	B	B	B	B	B	B	B	B
2	Maulida	B	S	B	B	B	B	B	B	B	B
3	Putri	B	S	B	B	S	S	B	B	B	B

Information: B = Correct Calculation; S = Incorrect Calculation

The table above shows that Maya's ability to perform arithmetic operations gets 10 times the correct value, followed by Maulida with 9 times the correct value, then Putri with 7 times the correct value. It can be said from the three

students that the average ability to calculate multiplication correctly is 86.7 times or a percentage of 86.7%

Table 3. Student Communication Results

No	Name	Communication Activities Conducted				Total Percentage
		1	2	3	4	
1	Maya	4	3	4	4	93,75 %
2	Maulida	3	3	3	3	75 %
3	Putri	2	3	2	4	68,75%

Description: 1. Students convey the form of multiplication
2. Students are actively discussing
3. Students respond to orders
4. Students appreciate

The table above shows that Maya's communication skills are 93.75%, followed by Maulida at 75%, while Putri is 68.75%. The average communication ability of the three children is 79.2%.

Notes from student daily journals show that students tend to be enthusiastic about using Canadian Multiplication Media, be patient waiting for their turn, and there is competition between students.

The standard of Mathematics competence in KTSP for grade II SD students is to multiply and divide a number to two numbers with the basic competence that must be mastered, namely multiplying numbers which results in two-digit numbers. The Canadian Multiplication Media created in this study has fulfilled the above basic competency components.

Canadian Multiplication Media is used to hone students 'abilities in multiplying numbers 1 to 9, as reinforcement of the basic concepts that they already have, and train students' sensitivity to number factors. Because basically before students use this media, first the basic concepts of students regarding multiplication, where multiplication is a repeated addition, must already exist.

The students' numerical literacy ability in the multiplication of two numbers showed 86.7% which indicated that this medium was suitable for use by grade 2

elementary school students while the student's communication results were 79.2%. This shows that Canadian Multiplication Media can be used as a means of developing communication skills between students or students and teachers as a bridge to solve problems.

Mass production of Canadian Multiplication Media can be carried out in various schools, especially in Lamongan Regency as a contribution of researchers to develop creative, innovative, and fun learning media. So that advanced educational governance in Lamongan Regency towards 2021 can be started from something small but has broad benefits.

4. Conclusion

The Standard Content of Mathematics at the basic education level states that one of the objectives of Mathematics in schools is for students to be able to communicate ideas to clarify situations or problems. Mathematical communication is communication of ideas by using reasoning in problem solving by paying attention to Mathematical concepts in order to have an attitude of appreciating the usefulness of mathematics in real life. One of the development forms of communication is numerical literacy activities. Numerical literacy is a process of knowledge or skills that applies arithmetic operations, in this case a multiplication operation of two integers that explores students' communication skills that are useful in problem solving. Canadian Multiplication Media is an effort as a form of teacher innovation in learning to develop student communication through numerical literacy activities.

The average communication ability of students is 79.2% while the average numerical literacy ability of grade 2 SD Negeri Medalem Kec. Modo Kab. Lamongan in the competency of multiplying two numbers shows 86.7%.

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