Numerical Literacy of Fifth Grade Elementary School Students in terms of Learning Styles through Google Classroom Assisted Discovery Learning Models

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Abstract:
This study aims to (1) analyze the quality of learning through the Discovery Learning model assisted by Google Classroom on students Numerical literacy; (2) analyzing students Numerical literacy based on students learning styles. The population in this study were fifth grade students at SDN 1 Gondosari for the 2020/2021 academic year with samples of classes VA and VB, each of who acted as the experimental class and control class. The research subjects consisted of 4 students with a visual learning style, 2 students with an auditory learning style and 1 student with a kinesthetic learning style. The method used in this study is a mixed method. The results of the study show that (1) the discovery learning model assisted by Google Classroom has the quality of improve students Numerical literacy (2) students with visual learning style are able to fulfill all components of the Numerical literacy indicators well.

Keywords: *Numerical Literacy, Learning Style, Discovery Learning Model, Google Classroom*

1. Introduction

Based on the results of the Trends In Mathematics and Science Study (TIMSS) 2015 which was just published in December 2016, Indonesia's student achievement in mathematics ranked 44th out of 49 countries with a score of 397, lower than the international average score of 500. With TIMSS criteria that divides the achievements of survey participants into four levels: low (400), medium (475), high (550) and advanced (625) from the score so that Indonesia's position is at a low level. In the most recent TIMSS which was held in 2019, Indonesia was absent from participating.

Trends in International Mathematics and Science Study (TIMSS) is an international assessment of math and science knowledge in 4th and 8th grade students worldwide. The study is organized by the International Association for the Evaluation of Educational Achievement (IEA), an international association to assess achievement in education that allows participating countries to compare the educational achievements of students around the world. TIMSS was first managed in 1995 and is conducted every 4 years. TIMSS measurement basis for mathematics and science itself consists of two domains, namely content and cognitive domains.

The results of the 2018 Program for International Student Assessment (PISA) study were released on Tuesday, December 3th, 2019. Based on the results of this study, Indonesia's 2018 PISA ranking

has dropped when compared to the 2015 PISA results. This 2018 study assessed 600,000 children aged 15 years from 79 countries every three years. This study compared the math ability, reading, and science performance of each child. As for the literacy category, Indonesia is ranked 6th from the bottom, aka rank 74. Indonesia's average score is 371, below Panama, which has an average score of 377. Meanwhile, at the first rank is occupied by China with an average score of 555. The second position is occupied by Singapore with an average score of 549 and Macau, China, third ranked with an average score of 525. Meanwhile, Finland, which is often used as an example of the education system, is ranked 7th with an average score of 520.

Indonesia is ranked 7th from the bottom (73) for the mathematics category with an average score of 379. Indonesia is above Saudi Arabia which has an average score of 373. Then for the first place, it is still occupied by China with an average score of 591. Then In the science performance category, Indonesia is ranked 9th from the bottom (71), with an average score of 396. Above Saudi Arabia, which has an average score of 386. China at the first ranked with an average score of 590. Based on the report In the latest report, Indonesia's performance seems to have decreased when compared to the 2015 PISA report.

Indonesia's scores based on the 2015 TIMSS and 2018 PISA results show that Indonesia is still low in the areas of math, reading, and science performance. Since 2016 the Ministry of Education and Culture has been activating the National Literacy Movement (NLM) as part of the implementation of the Minister of Education and Culture Regulation Number 23 of 2015 concerning the Development of Good Character. The Ministry of Education and Culture formed a working group for the National Literacy Movement to coordinate various literacy activities managed by related work units.

The National Literacy Movement is an effort to educate the nation's life through increasing understanding, knowledge, and skills needed in the 21st century through the involvement and participation of all Indonesian citizens. The National Literacy Movement develops six types of literacy needed to live in the 21st century. The six types of literacy are literacy, numeracy, science literacy, digital literacy, financial literacy, and civic literacy. As a movement, these six types of literacy are developed through three domains, namely the family (Family Literacy Movement), schools (School Literacy Movement), and society (Community Literacy Movement). One of the basic literacy that can be applied in elementary school education is numerical literacy.

Numerical skills are needed in all aspects of life, both at home and in society. In everyday and social life, for example when shopping, planning holidays, starting a business, building a house, information about health, all of which require numerical. This information is usually expressed in numerical or graphical form. To make the right decisions, students must understand Numerical. Numerical is the ability, confidence and willingness to engage with quantitative or spatial information to make informed decisions in all aspects of everyday life (Alberta, 2018).

Numerical literacy is the knowledge and skills to use various numbers and symbols related to basic mathematics to solve practical problems in everyday life and then analyze the information presented in various forms and interpret the results of the analysis to predict and make decisions (Kemdikbud, 2017). In simple terms, Numerical can be interpreted as the ability to apply number concepts and arithmetic operations skills in everyday life (for example, at home, work, and participation in community life and as a citizen) and the ability to interpret quantitative information found around

our. This ability is demonstrated by being comfortable with numbers and being able to use mathematical skills practically to meet the demands of life. This ability also refers to the appreciation and understanding of information that is expressed mathematically, such as graphs, charts and tables.

Numerical literacy is part of mathematics, in terms of the components of Numerical literacy taken from the scope of mathematics in the 2013 curriculum. One of the scopes of mathematics in the 2013 curriculum is numbers. The literacy component in question is estimating and calculating with integers (Kemdikbud, 2017). The fact that happens to students, namely that students are often unable to apply their mathematical knowledge in other fields, directly indicates the existence of a need that all teachers need to facilitate this process. This is very necessary in connection with the Minimum Competency Assessment (AKM) and character survey that will be held in 2021. The assessment was not carried out based on subject matter or mastery of curriculum material as has been applied in the National Examination, but instead carried out a mapping of the two minimum student competencies, namely in terms of literacy and Numeracy. So that Numerical Literacy really needs to be mastered by students.

Numerical Literacy indicators based on cognitive levels are as follows: (1) Knowing, this cognitive level assesses student's knowledge abilities about facts, processes, concepts, and procedures. Keywords commonly used at this level include remembering, identifying, classifying, calculating, taking/obtaining, and measuring. (2) Applying, this cognitive level assesses mathematical abilities in applying knowledge and understanding of facts, relations, processes, concepts, procedures and methods in the context of real situations to solve problems or answer questions. (3) Reasoning. This cognitive level assesses students' reasoning abilities in analyzing data and information, making conclusions, and expanding their understanding in new situations, including situations that were not previously known or in more complex contexts. Questions may cover more than one approach or strategy. The form of Numerical Literacy questions consists of: (1) Multiple choice, students can only choose one correct answer in one question. (2) Complex multiple choice, students can choose more than one correct answer in one question. (3) Matching, students answer by drawing a line from one point to another which is a pair of questions and answers. (4) Short entries. students can answer in the form of numbers, words to name objects or other definite answers. (5) Description.

One of the supporting factors related to numerical literacy is learning style. Knowing each other's learning styles will make students feel helped in absorbing information so that it makes it easier for these students to learn and communicate. Everyone has their own learning style and cannot be forced to use a uniform learning style (Edriati, Hamdunah, & Astuti, 2016). With differences in student learning styles, it is better if in the learning process a teacher must know student learning styles and deliver material according to student learning styles. By knowing students' learning styles, teachers can direct them to study according to their learning styles so that they can easily accept lessons and can improve their learning outcomes (Widayanti, 2013).

In addition to knowing student's learning styles to improve their learning outcomes, this needs to be supported by active and meaningful learning. Therefore, an alternative learning model that can be used to improve numerical literacy is the Discovery Learning Model. Discovery Learning Model is a learning model that encourages students to study independently. Students are actively involved in the discovery of concepts and principles through problem solving or the results of abstractions as

cultural objects. Teachers encourage and motivate students to gain experience by doing activities that allow them to discover mathematical concepts and principles for themselves. This learning can arouse student's curiosity.

Robert B. states that discovery is a mental process in which children/individuals assimilate concepts and principles. So, a student is said to be doing discovery if the child is seen using his mental processes in an effort to find concepts and principles. Mental processes carried out, for example observing, classifying, measuring, guessing and drawing conclusions. This is in line with Bruner's learning theory. Bruner's learning theory is discovery learning. Discovery learning from Jerome Bruner is a teaching model developed based on constructivist principles. According to Asmui (2009: 154), the Discovery Learning method is a method for developing an active way of learning students by finding themselves, investigating themselves, then the results obtained will be loyal and long lasting in memory, students will not easily forget. In discovery learning students are encouraged to learn on their own independently. Students are actively involved in discovering concepts and principles through problem solving or the results of abstractions as cultural objects. Teachers encourage and motivate students to gain experience by doing activities that allow them to discover mathematical concepts and principles for themselves. This learning can arouse students' curiosity.

Currently the world is being shocked by the outbreak of a disease caused by a virus called Corona or known as covid-19 (Corona Virus Diseases-19). Since Jokowi announced the first case of Covid-19 on March 2nd 2020, Indonesia has automatically become one of the countries affected by the corona virus. An appeal from the government to keep a distance or Physical Distancing in order to break the chain of distribution of Covid-19, this also has an impact on the world of education so that learning is done online from home (online). One example of learning innovation that can be done is using online learning media such as Google Classroom.

Google Classroom is a learning platform that can be used for the scope of education which is intended to help find a way out of the difficulties experienced in making assignments without using paper (paperless) (Iskandar et al, 2020: 144). Google Classroom is a blended learning platform developed by Google for schools or other educational institutions that aims to simplify creating, distributing, and implementing assignments in a paperless way.

According to Janzen M and Marry in Iftakhar (2016: 13) stated that the advantages of the Google Classroom application include (1) Easy to use because the design of the Google Classroom class deliberately simplifies the instructional interface and options used for sending and tracking assignments; communication with the whole course or individuals is also simplified through announcement notifications and emails. (2) Save time because Google classrooms are designed to save time by integrating and automating the use of other Google applications. (3) Cloud-based. Google Classroom brings more professional and authentic technology to use in learning environments because Google apps represent a large part of the communication tools. (4) Flexible because the application is easily accessible and can be used by infrastructure and students in both face-to-face learning environments and fully online environments. (5) It's free because Google Class itself can be used by anyone to open classes as long as they have a Gmail account. The following are the drawbacks of the Google Classroom application: (1) Web-based Google Classroom requires students and teachers to be connected to the internet network. (2) Learning is in the form of

individual so as to reduce students' social learning. (3) If students are not critical and material errors occur, it will have an impact on their knowledge. (4) Requires high hardware, software and internet network specifications.

Therefore, the researchers tried to conduct research on student's numerical literacy in elementary schools. Therefore, researchers will conduct research with the aim of analyzing numerical literacy in terms of student learning styles through the Google Classroom Assisted Discovery Learning Model in primary school.

2. Methodology

The method used in this research is quantitative. The population in this study was fifth grade students at SDN 1 Gondosari in the even semester of the 2020/2021 academic year. The sample in this study were students in class VB as an experimental class who were given treatment in the form of Discovery Learning model assisted by Google Classroom and class VA as a control class who were given treatment in the form of a problem-based learning model. Sampling is based on random sampling technique.

The data collection methods in this study used questionnaires, observation sheets, tests, and documentation. Data analysis begins with analyzing question items, preliminary data analysis which is then followed by hypothesis testing. Preliminary data analysis was carried out to find out whether the two sample groups had the same initial abilities, and it was found that the initial abilities of the students in grades VA and VB were the same. While testing the hypothesis includes learning due diligence consisting of individual due diligence and classical due diligence, average difference test, different student completeness proportion test, and gain test. Before carrying out the hypothesis test, a prerequisite test is carried out which includes a normality test using the Kolmogorov-Smirnov test and a homogeneity test using the Levene test with the help of SPSS 26.

3. Results And Discussion

Quality of Learning

The quality of learning consists of various stages, namely the planning, implementation, and assessment stages. This planning stage is through an assessment carried out by three expert validators with a scale of 5. Learning tools that are validated include syllabus, lesson plans, teaching materials and student activity sheets, learning style questionnaires, numerical literacy test questions and interview guidelines. Each device got the lowest average score of 4.60 for the Interview Guideline and the highest average of 4.78 for the numerical literacy test questions and the learning style questionnaire so it can be concluded that the learning tools are valid and good for use in research. The results of the numerical literacy test instrument can be seen in the following table.

Tabel 1.1 Recapitulation of Pre Test Trial Questions

No Qs	Validity		the level of difficulty		Differentiability		Reliability		Time (minutes)
	Number	Caption	Number	Caption	Number	Caption			
1	0,318	Invalid	0,47	Medium	0,286	Satisfactory	Point biserial reliability 0,700 (high)	essay reliability 0,718 (high)	5
2	0,507	Valid	0,68	Medium	0,214	Satisfactory			3
3	0,748	Valid	0,23	Difficult	0,491	*Good*			3
4	0,285	Invalid	0,62	Medium	0,143	Poor			10
5	0,464	Valid	0,78	Easy	0,357	*Good*			4
6	0,515	Valid	0,69	Medium	0,250	Satisfactory			8
7	0,859	Valid	0,42	Medium	0,634	*Excellent*			3
8	0,453	Valid	0,29	Difficult	0,286	Satisfactory			15
9	0,690	Valid	0,96	Easy	0,393	*Good*			5
10	0,665	Valid	0,99	Easy	0,543	*Excellent*			12
11	0,748	Valid	0,58	Medium	0,476	*Excellent*			8
12	0,837	Valid	0,31	Medium	0,615	*Good*			2
13	0,586	Valid	0,69	Medium	0,257	Satisfactory			12

Tabel 1.2 Recapitulation of Post Test Trial Questions

No Qs	Validity		the level of difficulty		Differentiability		Reliability		Time (minutes)
	Number	Caption	Number	Caption	Number	Caption			
1	0,200	Invalid	0,41	Medium	0,095	Poor	Point biserial reliability 0,708 (high)	essay reliability 0,734 (high)	5
2	0,801	Valid	0,69	Medium	0,485	*Good*			3
3	0,752	Valid	0,27	Difficult	0,454	*Good*			3
4	0,298	Invalid	0,69	Medium	0,179	Poor			10
5	0,624	Valid	0,77	Easy	0,500	*Excellent*			4
6	0,478	Valid	0,69	Medium	0,250	*Satisfactory*			8
7	0,878	Valid	0,62	Medium	0,689	*Good*			3
8	0,751	Valid	0,28	Difficult	0,714	*excellent*			15
9	0,602	Valid	0,71	Easy	0,357	*Good*			5
10	0,575	Valid	0,73	Easy	0,371	*Good*			12
11	0,424	Valid	0,35	Medium	0,238	*Satisfactory*			8

The results of the instrument trial of numerical literacy test questions from 11 questions, 8 questions were selected to be used as pretest and posttest questions based on the results of

validity, reliability, level of difficulty, discriminating power and indicators that contain students' numerical literacy.

In the implementation stage, a learning is said to be of high quality if the learning observation sheet and the observation sheet of student's responses and activities towards learning are in the minimum good category. The learning observation sheet scored 87.3%. The student response sheet to learning scored 82.23% and the student activity sheet to learning scored 84.5% with a very good interpretation.

The quality of the assessment stages can be seen from the effectiveness of learning with the Discovery Learning model assisted by Google Classroom on numerical literacy. Before conducting the effectiveness test, the prerequisite test was first carried out, namely the normality test and the homogeneity test using the help of SPSS 26.0. Normality test results obtained that the data comes from a normally distributed and homogeneous population. Based on the results of the research data obtained, an average test of ACL-based numerical literacy will be carried out with the help of SPSS 26.0 and $\alpha = 5\%$. In this test, the significance value is 0.006 <0.05, then H_0 is rejected. So it can be concluded that the average value of students' numerical literacy using the Discovery Learning model assisted by Google Classroom reaches the Actual Completion Limit (ACL).

The results of the classical completion test are used to test whether the proportion of students who reach the actual completion limit has reached 40%, using the z test obtained $Z_{hitung} > Z_{tabel}$, namely 4.56>1.64 then H_1 is accepted. This means that it can be concluded that the proportion of students who use the Discovery Learning model assisted by Google Classroom reaches classical completeness, namely 40%. The next test is the mean difference test used to determine whether the average numerical literacy of students in Discovery Learning assisted by Google Classroom is better than the average numerical literacy in PBL learning. The test used is the Independent Sample T-Test test which obtained the results of $t_{count} > t_{table}$ which is 2.29> 2.02, then H_0 is rejected. The conclusion is that the average numerical literacy of students in the Discovery Learning model assisted by Google Classroom is better than the average numerical literacy in Problem Based Learning model. With an average gain in the experimental class of 82.12 while the control class amounted to 72.73.

Furthermore, a different test was carried out on the proportion of student completeness using the z test, the results obtained $z_{count} > z_{tabel}$, namely 2.008>1.64, then H_0 was rejected. This means that the proportion of student's numerical literacy completeness in the experimental class is better than the control class. The last test conducted was testing the difference in the average increase in numerical literacy. The average N-Gain Percent for the experimental class was 56.15% while the average N-Gain for the control class was 37.20%. Furthermore, the t-test was conducted. It was obtained that tcount = 3.008 while ttable = 1.68. Because $t_{count} > t_{table}$, then H_0 is rejected which means that the average increase in student numerical literacy in Discovery Learning assisted by Google Classroom is higher than the average increase in numerical literacy in Problem Based learning.

The average Ngain_Persen value for the experimental class is 56.15%. Based on the interpretation category table of the effectiveness of the N-Gain value (%), it can be concluded

that the use of the Discovery Learning model assisted by Google Classroom is effective enough to improve student's numerical literacy.

The test results above show that the use of Discovery Learning model assisted by Google Classroom can be said to be qualified to improve students' numerical literacy. This is because the learning syntax that familiarizes students with numerical literacy in solving the problems given and the application of this strategy aims to provide opportunities for students to explore their knowledge and develop that knowledge to solve existing problems.

4. Conclusion

Based on the results and discussion, it shows that learning with the Discovery Learning learning model assisted by Google Classroom is declared qualified to improve students' numerical literacy. In the planning stage, the device was validated with the achievement of a very good category. At the implementation stage, the learning observation sheet is generally in the very good category as well as the response and observation of student activity towards the learning process is very positive. At the assessment stage, the final learning outcomes were declared quite effective in improving student's numerical literacy. The effectiveness is based on the test results which state: 1) The average numerical literacy of students using Discovery Learning model assisted by Google Classroom is more than or equal to ACL (Actual Completion Limit), (2) The numerical literacy of students using Discovery Learning model assisted by Google Classroom reaches classical completeness, which is students who achieve learning completeness more than or equal to 40%, (3) The average numerical literacy of students in Discovery Learning model assisted by Google Classroom is better than the average numerical literacy of students in Problem Based Learning model, (4) The proportion of student numerical literacy completeness in the Discovery Learning model assisted by Google Classroom is higher than the proportion of student numerical literacy in the Problem Based Learning model, (5) The average improvement of student's numerical literacy in Discovery Learning model assisted by Google Classroom is more than the average improvement of students' numerical literacy in Problem Based Learning model assisted by Google Classroom.

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