



Analysis of Mathematical Literacy Ability in terms of Learning Independence and Learning with the Sole Model Assisted by E-Module Flipbook Material on Mixed Calculation Operations

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Abstrak

Tujuan dari penelitian ini adalah untuk menunjukkan pembelajaran matematika dengan menggunakan model pembelajaran SOLE (*Self Organized Learning Environment*) berbantuan *E-Modul Flipbook* mencapai pembelajaran berkualitas dan mendeskripsikan proses berpikir literasi matematis ditinjau dari kemandirian belajar pada materi operasi hitung campuran. Teknik pengumpulan data menggunakan wawancara tidak terstruktur, angket, tes, dan dokumentasi. Penelitian ini menggunakan jenis penelitian *mixed methods research design* dengan desain eksplanatori Teknik analisis data menggunakan analisis kuantitatif dilanjutkan kualitatif, yaitu uji t satu variabel, uji beda, uji N-Gain, dan uji regresi. Hasil penelitian menunjukkan bahwa: (1) Kemampuan literasi matematis siswa lebih dari nilai KKM yaitu 75 dengan hasil nilai $t_{hitung} = 1,975 (> 1,706)$ dan nilai signifikansi $0,042 (< 0,05)$; (2) Terdapat peningkatan kemampuan literasi matematis sebesar 39,73% setelah pembelajaran dengan model SOLE menggunakan *e-modul flipbook*; (3) Ada pengaruh kemandirian terhadap kemampuan literasi matematis siswa sebesar 89,6% sehingga dapat disimpulkan bahwa semakin besar kemandirian siswa maka semakin tinggi kemampuan literasi matematis siswa.

Kata Kunci: Kemandirian siswa, Kemampuan literasi matematis, SOLE, *E-modul Flipbook*

Abstract

The aim of this research is to show that mathematics learning using the SOLE (Self Organized Learning Environment) learning model assisted by the Flipbook E-Module achieves quality learning and describes the mathematical literacy thinking process in terms of independent learning in mixed arithmetic operations material. Data collection techniques use unstructured interviews, questionnaires, tests and documentation. This research uses a mixed methods research design with an explanatory design. The data analysis technique uses quantitative analysis followed by qualitative, namely one variable t test, difference test, N-Gain test, and regression test. The results of the research show that: (1) The students' mathematical literacy skills are more than the KKM value, namely 75, with a t-count = 1.975 (> 1.706) and a significance value of 0.042 (< 0.05); (2) There was an increase in mathematical literacy skills by 39.73% after learning with the SOLE model using the flipbook e-module; (3) There is an influence of independence on students' mathematical literacy abilities of 89.6% so it can be concluded that the greater the students' independence, the higher the students' mathematical literacy abilities.

Keywords: Student independence, mathematical literacy skills, SOLE, Flipbook E-module

Introduction

Based on the PISA assessments in 2000, 2003, 2006, 2009 and 2012, there are 76% of Indonesian children who have not been able to reach level 2, even though level 2 is in the minimum category out of the low achievers. Then, on the other hand, the number of students entering the highest level, namely level 5, only reached 0.3%. The 5 PISA results indicate that most children in Indonesia are at level 1 in mathematical literacy skills (Muzaki & Masjudin, 2019).

The Ministry of Education and Culture released the results of the PISA 2022 study on Tuesday 5 December 2023, stating that the results of the recent 2022 Program for International Student Assessment (PISA) research showed that Indonesia was ranked 68th with a score of; math (379), science (398), and reading (371). This study evaluated the achievement of 15-year-old students in the disciplines of mathematics, reading, and science. Around 690 thousand students from 81 countries participated in PISA 2022, and this survey is carried out every three years. Since 2000, the OECD has consistently conducted these assessments.

Overall, the PISA 2022 results can be categorized as among the lowest, on par with the results obtained in 2003 in reading and mathematics, and in 2006 in science. Although the results of some previous assessments were higher than the results observed in earlier years, this increase reversed with a decline seen in 2015 and beyond. This means that since our participation in PISA from 2000 to 2022, there has not been a significant increase in quality as represented by the scores obtained during 2000-2022.

Based on the PISA results, there is something quite worrying, namely, it turns out that only 18% of our students can obtain a minimum of level 2 mathematics proficiency. Meanwhile, information is not available for the other 82%. Can these children be said to be functionally mathematically illiterate? Level 2 means students can interpret and recognize, without direct instruction, how simple situations can be represented mathematically (for example comparing the total distance on two alternative routes, or converting prices into different currencies).

Almost none of our 15-year-olds perform well in mathematics, that is, obtain a level 5 or 6 in mathematics assessments (OECD average: 9%). Similar conditions were found in the fields of science and reading. Six Asian countries and economies obtained levels 5 and 6, including Singapore (41%), Taiwan (32%), Macau (29%), Hong Kong (27%), Japan (23%), and Korea (23%).

Then, based on previous research, it is known that students' mathematical literacy abilities are still low, because the maximum score obtained by students is only at level 3. Meanwhile, these mathematical literacy abilities are very meaningful and important for students to have. (Fiad Uluf; Suharto; Kurniati, 2017)

Mathematical literacy is the knowledge to recognize and practice basic mathematics in our daily lives. Indonesian students' mathematical literacy abilities based on the 2015 PISA results are ranked 63rd out of 72 countries, with indicators namely 1) formulating real problems; 2) mathematization (utilizing mathematics in problem solving); 3) interpret solutions; 4) evaluate solutions. Referring to the specified indicators, it turns out that the survey results regarding mathematical literacy abilities based on these four indicators are still low.

Students' low mathematical literacy abilities are influenced by the low quality of mathematics learning, and learning is still teacher-centered. Learning using ICT (information and communication technologies) as a medium is quite important, because when viewed from the material or teaching, both influence students' results and interest in learning. Besides that, ICT makes it easier for teachers to explain abstract mathematical material so that it is easy for students to understand (Rahmawati, 2018). Utilization of ICT can be in the form of a Flipbook E-module which is easy to access and use. Regarding mathematical literacy skills which are still low when viewed from student independence, it turns out that this is also influenced by the student's low level of independence as well.

Based on the description above, there are two problems in learning, namely; 1) Student independence in learning is still low, because students only depend on explanations from the teacher so that students are passive in learning. 2) Students' interest in learning is still lacking, this influences the low level of students' mathematical literacy abilities. Referring to this, learning models and media are needed that can attract

students' interest and independence so that they can change the learning process from teacher-centered to student-centered.

The solution offered to address the above problems is the application of the SOLE (Self Organized Learning Environment) learning model. The reason is because SOLE is a learning model that is able to emphasize student independence and has the aim of building critical thinking competencies, problem solving abilities and communication skills. It is hoped that by implementing the SOLE model students will have a main role in being active in learning and instilling an independent attitude and learning effectiveness in students (Fariha, 2021)

In order to improve students' mathematical literacy skills regarding Mixed Counting Operations material, in implementing the SOLE learning model, they need to be assisted with media that is appropriate to the material being taught. The media used is the Flipbook E-Module. Based on previous research, it has been concluded that students tend to have a positive opinion when using the Flipbook E-module media in the digital learning process (Roemintoyo & Budiarto, 2021). Through the results of research conducted by Roemintoyo and Budiarto, it can be used as reference material for utilizing digital flipbook media to create an interesting and quality learning process. The following explains some of the advantages of flipbooks, including, this application can be operated via Android cellphones and computers whenever and wherever students are as long as they are connected to the internet, so it will make the learning process easier both independently and in groups, because it can be inserted with videos, images or audio so it doesn't matter. just text (Mardiana & Harti, 2022).

The research carried out by the researcher is not new research in the world of education but is based on references from several studies that have been carried out by previous researchers, namely; 1) Research by Fariha, A. (2021). SOLE Learning in Building Learning Effectiveness in Students. 2) Firdaus, FM, Pratiwi, NA, Riyani, S., & Utomo, J. (2021). Increasing the learning independence of elementary school students using the SOLE Model during the Covid-19 pandemic. 3) Fiad Uluf; Suharto; Kurniati, D. (2017). Identification of the Mathematical Literacy Ability of Students

at SMP Negeri 12 Jember in Solving PISA Questions with Space and Shape Content. 4) Masfufah, R., & Afriansyah, EA (2021). Analysis of Students' Mathematical Literacy Ability through PISA Questions. ... Mathematics. 5) Rahmawati, NI (2018). Utilization of ICT in Improving Mathematical Literacy Skills. 6) Roemintoyo, R., & Budiarto, MK (2021). Flipbook as Innovation of Digital Learning Media: Preparing Education for Facing and Facilitating 21st Century Learning. What differentiates this research from previous research is that this research combines the SOLE model with a flipbook e-module to increase student independence and mathematical literacy skills so that it becomes quality learning.

Based on several reasons, in accordance with the real conditions of mathematical literacy learning at SD Negeri 03 Doro, researchers feel it is necessary to apply the learning model SOLE (Self Organized Learning Environment) assisted by flipbook e-modules in class VI students at SD Negeri 03 Doro, Doro District, Pekalongan Regency. Learning model SOLE This is implemented based on the syntax of the learning model combined with the flipbook e-module as follows: 1) Asking questions related to the material to be studied, 2) Organizing students, 3) Student exploration and investigation; 4) Monitoring; 5) Presentation of exploration and investigation results; 6) Evaluate the results of the presentation.

Method

The research design used is Mix Method Design (mixed research). *Mixed Methods* is research that combines or associates qualitative forms and quantitative forms (Sukestiyarno, 2020). Creswell, 2012 in (Sukestiyarno, 2020) explained that mixed research would be useful if the research results were mixed methods quantitative or qualitative research methods are less accurate. This research uses a mix method design type "The Explanatory Sequential Design", starting from quantitative research and continuing with qualitative research.

The experimental design used in this research is *Quasi Experimental Design*. The sampling technique is Cluster Random Sampling. The selection of 2 class samples was intended to

simplify the research process because it was carried out in 1 group, namely the Samiaji group. As a sample there are two classes which include: SDN 03 Doro as a classexperiment and SDN 02 as the control class.

Data was collected through interviews and documentation. To verify the strength of the data in this research, data triangulation was used. Instruments are used to measure the variables studied, writing ability tests, questionnaires and study tools. Analysis Qualitative data in this study was used to describe mathematical literacy abilities in terms of student independence in mathematics learning based on high, medium and low groups. Qualitative data analysis was carried out using four steps, namely testing data validity, data reduction, data presentation, and drawing conclusions.

The research procedure carried out by the researcher was carried out in two stages, namely the Pre-Field Stage and the Field Work Stage. Learning quality is the study material that will be examined in this research which includes "planning, implementation and assessment". At the planning stage; preparing a research design, choosing a research location, arranging permits, conducting initial observations, and preparing research equipment. Then the implementation stage includes conducting initial tests, giving questionnaires, implementing the SOLE model assisted by flipbook e-modules, giving post tests, and conducting interviews with research subjects. Next, at the assessment stage, to determine the effectiveness of quality learning, includes steps; determining the quality of planning, observing during learning, and providing student and teacher response questionnaires to determine the practicality of a learning tool.

This research uses a mix method design so that there are two types of data, namely quantitative data and qualitative data. Quantitative data can be obtained from the results of students' mathematical literacy ability tests. Qualitative data can be obtained from the answer sheet for the mathematical literacy ability test (documentation study), the results of the questionnaire for independence in learning mathematical literacy skills (observation), and the results of the mathematical literacy ability interview.

The population of this study was class VI elementary school students in Gugus Samiaji, Doro District, Pekalongan Regency, with a total of 9 classes from 9 State Elementary Schools.

The random samples taken were 20 class VI students at SDN 03 Doro as the experimental class and SDN 02 Doro as the control class.

The instruments used are mathematical literacy ability tests, learning independence questionnaires, and learning tools. Then regarding data collection procedures, this research used unstructured interviews to determine mathematical literacy abilities in terms of learning independence. The interviews were conducted after the mathematical literacy ability test was carried out.

Results and Discussion

A. Research result

1. Description of Research Data

a. Quantitative Research

In the first stage, collect and analyze quantitative data, to answer the formulation of the research problem "Can learning using the SOLE model assisted by flipbook e-modules achieve quality learning?".

Quantitative Research was carried out in the 2023/2024 academic year semester 1 (August - October 2023). Meanwhile, the implementation process can be seen in the following table.

Table 4.1 Quantitative Research Implementation Schedule

b. Qualitative Research

In the second stage, qualitative data was collected and analyzed to answer the formulation of the first research problem, namely "What is the mathematical literacy thinking process in terms of independent learning in mixed arithmetic operations material?"

Qualitative research was carried out in the 2023/2024 academic year, semester 1 (24-26 September 2023). Then the process of implementing qualitative research was carried out with the stages of giving an independence questionnaire, giving questions about mathematical literacy skills and interviews.

2. Test the Analysis Prerequisites

a) Normality Test

Based on the normality test with the Shapiro-Wilk test, the sig value for the experimental class pretest was 0.230, the experimental class posttest was 0.052, then for the control class pretest 0.119, the control class posttest was 0.068. Because the sig value $> \alpha = 0.05$ then H_0 is accepted. So the pretest and posttest from the control and experimental classes have normal distribution.

b) Homogeneity Test

Based on the homogeneity test, the value obtained is $\text{sig} = 0.596 > \alpha=0.05$, so H_0 is accepted. This means that the data on the mathematical literacy ability (initial) of the control class and the experimental class varied homogeneously at the significance level $\alpha = 0.05$.

3. Final Analysis

a) Descriptive statistics

Based on the statistical measurement table for descriptive analysis, it is known that the average score of 20 students in the control class is 66.80 while the average of 20 students in the experimental class is 77.25. At first glance, it can be assumed that the average achievement scores for mathematical literacy skills for control class and experimental class students are much different. To strengthen this assumption, it is necessary to test the hypothesis.

b) Descriptive statistics

b). Inferential statistics

This research used a one sample t-test (Hypothesis 1), paired sample t-test and N-Gain test (Hypothesis 2), and Linearity Test, normality test and simple linear regression test (Hypothesis 3).

1) Hypothesis 1

Table 4. 7.
 Determining the Average Value of
 Mathematical Literacy Ability

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Mathematical Literacy Ability	20	77.25	10,321	2,308

Table 4.8 Determining Significance Values

One-Sample Test						
Test Value = 75						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Mathematical Literacy Ability	1,975	19	,042	2,250	-2,58	7,08

Based on calculations using the proportion test with a real level of 5%, SPSS calculations obtained a Sig value. (2-tailed) = 0.042 < 0.05. So it is rejected, meaning that the average student's mathematical literacy ability in the subject $t_{hitung} \geq t_{tabel} \leftrightarrow 1,975 > 1,706 H_0$ Mathematics material for mixed arithmetic operations class VI students with the SOLE (Self Organized Learning Environment) model based on flipbook e-modules exceed the KKM. This is reinforced based on the test data results of 16 students out of 20 students completing the test, meaning that the percentage of the experimental class is around 80% completing the KKM.

2) Hypothesis 2

Based on the results of the control class posttest t test, the Sig value. (2-tailed) = 0.787 > 0.05, so there is no difference in the results of the control class students' mathematical literacy abilities during the posttest, while the results of the posttest t test for experimental class students were sig. (2-tailed) = 0.001 < 0.05, so there is a difference in the results of students' mathematical literacy abilities during the posttest on class VI mixed arithmetic operations material. So there was an increase in mathematical literacy skills in the experimental class of students after the learning was carried out.

The calculation of the normalized Gain score in this study is as follows:

$$N - Gain = \frac{Skor Postest - Skor Pretest}{Skor Maks - Skor Pretest} \times 100$$

$$\frac{77,25 - 62,25}{100 - 62,25} \times 100 = \frac{15,00}{37,75} \times 100 = 39,73$$

3) Hypothesis 3

Table 4.10. Simple Linear Regression Anova

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1812,959	1	1812,959	154,813	,000b
	Residual	210,791	18	11,711		
	Total	2023,750	19			

a. Dependent Variable: Mathematical Literacy Ability
 b. Predictors: (Constant), Independence

In the Anova output results, the value Sig = 0.00 < 0.05 is obtained, so H0 is rejected. So, it can be concluded that there is a significant influence between student independence on students' mathematical literacy skills in mathematics lessons regarding mixed arithmetic operations with the SOLE (Self Organized Learning Environment) model based on flipbook e-modules. After that, the regression coefficient test was carried out,

Table 4.11. Coefficients Simple Linear Regression Test

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	9,415	5,505		1,710	,004
Independence	2,019	,162	,946	12,442	,000

a. Dependent Variable: Mathematical Literacy Ability

In the Coefficients output results, the Sig value is obtained. (constant) = 0.004 < 0.05 and Sig. (independence) = 0.000 < 0.05, so H0 is rejected. So, the regression coefficient is significant. Because the assumptions about the linearity of the model and the significance of the

regression coefficients are met, the linear regression equation obtained can be used.

From the Coefficients output results, it can be seen that the Constant (α) value is 9.415 and the β (Independence) coefficient value is 2.019. The following is the form of a simple linear regression equation for these two variables:

$$Y = \alpha + \beta X = 9.415 + 2.019$$

Table 4. 12. Model Summary of Simple Linear Regression Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,946a	,896	,890	3,422

a. Predictors: (Constant), Independence

Based on the Model Summary output, it is known that the correlation/relationship value (R) is 0.946, which indicates a strong and positive relationship between the two. From this output, a coefficient of determination (R square) value of 0.896 was obtained. Which means that the influence of student independence and the variable of students' mathematical literacy abilities is materialmixed arithmetic operations89.6% of students were caused by other factors

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a. Qualitative Analysis

Determining the research subject, the researcher gave a pretest to class IV students at SD Negeri 03 Doro, totaling 20 students. Pretest questions on mathematical literacy skills and student independence questionnaires were carried out before implementing learning material using mixed arithmetic operations with the SOLE (Self Organized Learning Environment) model assisted by the Flipbook E-Module. The results of each student's pretest are then checked and a score is obtained. Based on the data obtained, the researchers sorted them starting from low value, average value and high value. In full, the student groupings can be read as follows:

Table 4. 2 Results of Pretest Mathematical Literacy Ability

Mark	Range	Qty	Percentage	Student Code
1	46-60	12	60%	S-01, S-05, S-06, S-07, S-08, S-10, S-12, S-13, S-15, S-16, S-18, S-19,
2	61-75	4	20%	S-02, S-03, S-11, S-14,
3	76-90	4	20%	S-04, S-09, S-17, S-20

Based on the pretest results in table 4.2, the level of mathematical literacy abilities of the 20 students varies. The average student pretest score was 62.25. The fourth grade students at SD Negeri 03 Doro are mostly in the 60 and below range with a percentage of 60%. The range 61-75 is 20% and 76-90 is 20%.

Based on this table and the criteria that have been determined, the researcher determined the research subjects based on the results of students' mathematical literacy skills in mixed arithmetic operations material, namely 2 students with the highest scores, 2 students with average scores, and 2 students with the highest scores.

The results of the work of the six selected research subjects were used to represent each level for deeper analysis with interviews regarding mathematical literacy abilities in mixed arithmetic operations material. The

research subjects used were S-04, S-17, S-02, S-03, S-12, and S-15

b. Analysis of mathematical literacy abilities

After selecting research subjects, the researcher analyzed the pretest scores and posttest scores. The following are the results of the pretest and posttest mathematical literacy abilities of the research subjects in table 4.3

Table 4.3 Pretest and Posttest Results of Research Subjects

NO	Research Subjects	KLM Pretest	KLM posttest	Information
1.	S-04	80	95	Increase
2.	S-17	85	90	Increase
3.	S-02	70	80	Increase
4.	S-03	67	80	Increase
5.	S-12	55	60	Increase
6	S-15	45	60	Increase

Based on Table 4.3 above, research subjects in the lower group, average group and upper group experienced an increase in their mathematical literacy skills in mixed arithmetic operations material with varying levels of improvement. In the lower group, namely S-12, there was an increase of 8.3%. Meanwhile, the S-15 experienced an increase of 25%. Then in the average group, namely S-02, there was an increase of 12.5%, while S-03 experienced an increase of 16.25%. Furthermore, the increase in the top group, namely S-04, was 11.1%, while S-17 experienced an increase of 5.56%.

Analysis of indicators of mathematical literacy ability for mixed arithmetic operations material was carried out based on the results of work on test questions and the results of interviews with determined research subjects. The researcher took 1 question from the results of the research subject's work with measures of mathematical literacy ability using 4 indicators according to the author's conclusion based on references from several experts and other sources, namely:

- a) Formulate the problem (Individual ability to identify the problem at hand)
- b) Mathematization (Ability to change problem descriptions into mathematical sentences)
- c) Choosing the right method (Ability to

- choose a strategy to solve math problems)
d) Evaluating solutions (Ability to evaluate solutions to problem solving)

c. Analysis of Student Independence

The benchmarks used in this research to interpret student independence are as follows in Table 4.4:

Table 4. 5 Data on Independence of Experiment Class Students

Student	Pre-	Lesson 1	Lesson 5
S-01	2	2.7	3.5
S-02	2.6	3,4	4.2
S-03	2.7	3	4.2
S-04	3	4	4.7
S-05	3	3,4	4
S-06	2.6	3.5	4
S-07	2.6	3,4	4
S-08	2	2.7	3.5
S-09	3	3,4	4.7
S-10	2	2.7	3.5
S-11	2.7	3	3.5
S-12	2	2.7	3
S-13	3	3,4	4
S-14	3	3.6	4
S-15	2.7	3	3
S-16	2.7	3	4
S-17	3	3,4	4.7
S-18	3	3,4	4
S-19	2.7	3	4
S-20	3	3.6	4.7
Average	2,665	3,215	3.96

Based on data from the independence questionnaire at the pre-meeting, learning from the 1st meeting and the 5th meeting, students in the experimental class experienced an increase in independence, from 2.66 at the pre-meeting, increasing at the 1st meeting to 3.215 and increasing again at the 5th meeting. to 3.96. So it can be concluded that the experimental class experienced increased independence.

Research subjects S-04, S-17, S-02, S-03, S-12, and S-15 also always experienced an increase from the pre-meeting, 1st meeting and 5th meeting. In subject S-04, the score at the pre-

meeting was 3.0, at the first meeting 4.0 and at the second meeting 4.7 (very good category). Furthermore, subject S-17 got a score at the pre-meeting of 3.0, first meeting 3.4 and fifth meeting 4.7 (very good category). Subject S-02 got a score at pre-learning of 2.6 at the first meeting, 3.4 and at the fifth meeting, 4.2 (good category). Subject S-03 got a score at pre-learning of 2.7 at the first meeting, 3.0 and at the fifth meeting, 4.2 (good category). S-12 subjects got a score at pre-learning of 2.0 at the first meeting, 2.7 and at the fifth meeting, 3.0 (fairly good category). Then Subject S-15 got a score at pre-learning of 2.7 at the first meeting, 3.0 and at the fifth meeting, 3.0 (fairly good category).

Researchers carried out analysis of indicators of student independence using a 24-item independence questionnaire containing elements of 8 indicators of independence. The maximum value used is 5 for each question. In indicators 1-8 there are 3 questions each.

So in this study it can be concluded that in class IV SD N 03 Doro in the final assessment (posttest) regarding independence there were 2 students in the moderate or lower category with a percentage of 10%, 14 students in the good or middle category with a percentage of 70%, and 4 students with a very good or top category with a percentage of 20%. According to the Ministry of National Education (2010:34), the middle category means that students are able to be enthusiastic about learning to ask about events or problems and participate in discussing them. Meanwhile, the top category means that students have met the indicators of independence, namely that students often ask questions during the learning process, look for sources of information from the internet or outside textbooks and are able to discuss problems that must be solved during learning.

1. Discussion of Quantitative Research

In quantitative research, researchers use learning models and media that are able to increase student independence. In this case the researcher uses a learning modelSOLE (Self Organized Learning Environment) assisted by Flipbook E-Module. Research on the achievement of mathematical literacy skills from mixed arithmetic operations in class VI elementary school students was carried out in the control class and experimental class. In the experimental class, students receive model learningSOLE (Self Organized Learning Environment) assisted by Flipbook E-Module,

while in the control class students used conventional learning. The aim of this research is to find out: 1) students' mathematical literacy abilities in model learningSOLE (Self Organized Learning Environment) assisted by Flipbook E-Moduleachieving BTA classically achieves learning completion of more than 75%. 2) Average students' mathematical literacy abilities in model learningSOLE (Self Organized Learning Environment) assisted by the Flipbook E-Module in the experimental class is better than the average mathematical literacy ability of the conventional model in the control class. 3) Learning independence has a positive effect on mathematical literacy abilities in the experimental class in learning mathematics material on mixed arithmetic operations in class VI.

Based on the results of research on hypothesis 1 in the experimental class by applyingSOLE (Self Organized Learning Environment) model learning assisted by Flipbook E-Moduleshows that the average value of students' mathematical literacy skills in mixed arithmetic operations material has reached the KKM. This is based on the two-way Anova test

obtained $F_{hitung} > F_{tabel}$, so that H_0 rejected, thirdThe population average is not identical, in other words, the population average is the value of mathematics lesson results, mixed arithmetic operations material for the class, namely the experimental class with the SOLE (Self Organized Learning Environment) learning model assisted by the Flipbook E-Module. and the control class with the conventional model is not the same or it can be interpreted that there is a difference in the results of mathematics lessons on mixed arithmetic operations material for students between those who received the SOLE learning model assisted by the Flipbook E-Module and the conventional model. The results show that the tailed Sig.2 value is 0.042 or less than 0.050, meaning that the average of experimental class students is more than the KKM. The results of this research analysis are in accordance with the hypothesis which states that students' mathematical literacy abilities in the SOLE learning model assisted by the E-Module Flipbook achieve classical BTA, namely the proportion of students who achieve learning completeness is more than 75%.

Based on the results of hypothesis 2 from the pretest and posttest scores of the experimental

class, there was an increase in mathematical literacy skills after implementing the learning modelSOLE assisted by Flipbook E-Module. This is because the tailed Sig.2 value in the Paired Sample t Test is less than 0.05 so hypothesis 2 is accepted. The increase in mathematical literacy skills of class VI students at SDN 03 Doro was equal to 39.73 from the results of the N-gain calculation, which means that the experimental class experienced a moderate increase.

In testing hypothesis 2, the aim is to find out whether there is a significant difference in the achievement of mathematical literacy skills among students who receive learning model learningSOLE assisted by Flipbook E-Module and students who receive conventional learning.

a. Comparison of mathematical literacy abilities (initial) between students who received model learningSOLE (Self Organized Learning Environment) assisted by Flipbook E-Modulewith students who receive conventional learning.

Benjamin S. Bloom in Wulandari (2005) states that initial abilities are very necessary to support students' understanding before being given new knowledge. For this reason, in this study the researcher gave pretest questions to determine initial mathematical literacy abilities in the control class and experimental class. This is necessary because one of the requirements of explanatory sequential research is that the initial mathematical literacy skills of control class and experimental class students must be equivalent, so that it will make subsequent data analysis techniques easier.

The results of the descriptive statistical test of mathematical literacy ability (initial) in the control class of 20 students were: maximum value in Mathematics = 85, minimum value = 50, average = 63.20 with median = 61.5, mode = 60, and standard deviation = 10.551. Meanwhile, in the experimental class, the results of descriptive statistical tests on the mathematical literacy skills (initial) of 20 students were: maximum mathematics score = 85, minimum score = 45, average = 62.25 with median = 60, mode = 60, and standard deviation = 11.511.

Based on descriptive statistics, the mathematical literacy abilities (initial) of students who will receive SOLE (Self

Organized Learning Environment) model learning assisted by Flipbook E-Modules in the experimental class and students who will receive conventional learning are not significantly different at the significance level $\alpha = 0.05$. So the requirements for quantitative research in the control class and experimental class have been fulfilled.

The results of this test show that there is an influence of the form of learning on students' (initial) mathematical literacy abilities. The form of learning used in this research is learning using the SOLE (Self Organized Learning Environment) model assisted by the Flipbook E-Module.

The SOLE (Self Organized Learning Environment) model of learning is assisted by the Flipbook E-Module as a step to direct students towards increasing student independence. This means that students who study using the SOLE (Self Organized Learning Environment) model assisted by the Flipbook E-Module have been trained to develop mathematical literacy independently.

b. Comparison of achievement of mathematical literacy skills (final) between students who received model learning SOLE (Self Organized Learning Environment) assisted by Flipbook E-Module with students who receive conventional learning.

Achievement of mathematical literacy skills (final) in the control class and experimental class can be seen from the post-test results. The post-test to measure the achievement of students' mathematical literacy skills was carried out after each student in the control class and experimental class had received learning in five meetings. Learning in the control class and experimental class is carried out by the same teacher. The difference lies in the treatment of the two classes.

In the experimental class, students receive learning using the SOLE (Self Organized Learning Environment) method assisted by the Flipbook E-Module, while in the control class, students receive conventional learning. The forms of questions tested in the post-test are the same as those given in the pre-test.

The post-test data in this study is referred to as the achievement of students' mathematical literacy abilities. From the results of hypothesis testing with two

independent one-party t-tests, it was concluded that the achievement of mathematical literacy skills of students who received learning using the SOLE (Self Organized Learning Environment) model assisted by Flipbook E-Modules was significantly higher than students who received conventional learning in α level = 0.05.

The post-test results showed that students in the control class experienced a change in their average score from 63.20 to 66.80. This means that for students who receive conventional learning the increase in achievement of mathematical literacy skills is 3.60. Meanwhile, students in the experimental class also experienced an increase in their average score from 62.25 to 77.25. This means that for students who receive learning using the SOLE (Self Organized Learning Environment) model assisted by the Flipbook E-Module, the increase in achievement of mathematical literacy skills is 15.00.

Based on the explanation above, it appears that the achievement of mathematical literacy skills of students who receive learning using the SOLE (Self Organized Learning Environment) method assisted by E-Module Flipbook is significantly higher than students who receive conventional learning. Why is that? Achieving mathematical literacy skills is an achievement where it appears that students' ability to mathematical literacy from mixed arithmetic operations meets the 4 predetermined indicators. The indicators for mathematical literacy skills from mixed arithmetic operations include: 1) Formulate the problem, 2) *Mathematization*, 3) Choosing the right method, and 4) Evaluate solutions. So, to achieve mathematical literacy skills, especially mixed arithmetic operations material, students must understand and be able to understand the four indicators of mathematical literacy skills thoroughly.

Furthermore, based on the results of the simple linear regression analysis, it shows that there is an influence of student independence on mathematical literacy skills using the learning model SOLE. The results of this analysis are in accordance with the statement of hypothesis 3, namely that there is an influence of independence on mathematical literacy abilities. Based on the research results, it was found that the magnitude of the influence of independence

on students' mathematical literacy skills in mixed arithmetic operations material was 89.6%, meaning that the remaining 10.4% was influenced by other factors. The higher the student's independence, the higher and higher the value of mathematical literacy skills in mixed arithmetic operations material. Based on this, model learning is carried outSOLE (Self Organized Learning Environment) assisted by Flipbook E-Moduleable to increase student independence and improve mathematical literacy skills in mixed arithmetic operations material.

From the discussion above, in order to achieve mathematical literacy skills, especially mixed arithmetic operations material, students must understand and be able to understand the four indicators of mathematical literacy skills thoroughly.

The research results above are also supported by the results of observations during the research. The learning process using the SOLE model assisted by the Flipbook E-Module brings changes to classroom learning, especially in terms of student independence. With a high attitude of independent learning, students will be more skilled in mathematical literacy regarding mixed arithmetic operations.

From the qualitative research, three groups were obtained based on the level of mathematical literacy ability, namely group 1 with a high level of mathematical literacy ability, group 2 with a medium level of mathematical literacy ability, and group 3 with a low level of mathematical literacy ability.

2. Discussion of Qualitative Research

Referring to the results of qualitative research, three groups were obtained based on the level of mathematical literacy ability, namely group 1 with a high level of mathematical literacy ability, group 2 with a medium level of mathematical literacy ability, and group 3 with a low level of mathematical literacy ability. Differences in mathematical literacy abilities in each category can be seen in table 4.13 below:

Table 4. 13. Mathematical Literacy Ability

Category	Subject	Indicator
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		1	2	3	4
Tall	S-04	Fulfil	Fulfil	Fulfil	Fulfil
	S-17	Fulfil	Fulfil	Fulfil	Fulfil
Currently	S-02	Fulfil	Fulfil	Does not meet the	Does not meet the
	S-03	Fulfil	Fulfil	Does not meet the	Does not meet the
	S-12	Fulfil	Does not meet the	Does not meet the	Does not meet the
Low	S-15	Fulfil	Does not meet the	Does not meet the	Does not meet the

Group 1 with a high level of mathematical literacy ability was able to solve mathematical problems in accordance with the four indicators of mathematical literacy ability, then students with moderate ability were able to solve mathematical literacy questions in accordance with 2-3. Meanwhile, students with low academic abilities only have one indicator fulfilled in the mathematical literacy ability indicator.

Based on the results of qualitative research analysis, it is known that groups of students with high mathematical literacy abilities have a high level of independence, groups of students with moderate mathematical literacy abilities have a moderate level of independence and groups of students with low mathematical literacy abilities have a low level of independence. Based on this description, it can be seen that the level of student independence influences students' mathematical literacy abilities.

Conclusion

Based on statistical data analysis, research results and discussion, the conclusion that can be

drawn from this research is that learning with the SOLE (Self Organized Learning Environment) model assisted by the Flipbook E-Module can achieve quality learning, this can be seen from the indicators as follows: 1) Students' writing literacy skills in the SOLE (Self Organized Learning Environment) learning model assisted by the Flipbook E-Module reached classical BTA, namely the proportion of students achieving learning completeness of more than 75%. 2) The achievement of mathematical literacy skills of

students who receive learning using the e-module-based SOLE (Self Organized Learning Environment) model is significantly higher than students who receive conventional learning. 3) Learning independence has a positive effect on mathematical literacy skills in the experimental class in learning mathematics for mixed arithmetic operations in class VI.

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