# Learning Environment and Learning Facilities: Numeracy Literacy for Class V Elementary School Students during the Pandemic

## Ujang Efendi[1*], Deviyanti Pangestu [2*], Hasan Hariri[3], Rizqi Amalia Berlianti[4]  ID

[1,2,3,4] Universitas Lampung, Bandar Lampung, Lampung, Indonesia

**A B S T R A K**

*Literasi numerasi peserta didik indonesia tergolong rendah. Fasilitas belajar yang lengkap dapat menunjang ketercapaian hasil belajar peserta didik. Penelitian ini bertujuan untuk menganalisis pengaruh lingkungan belajar dan fasilitas belajar terhadap literasi numerasi peserta didik. Jenis penelitian ini adalah kuantitatif dengan metode penelitian ex-post facto dengan desain survey. Populasi keseluruhan terdiri dari 24 sekolah dasar negeri dengan jumlah siswa 523 orang. Teknik pengambilan sampel menggunakan cluster sampling. Metode pengumpulan data melalui metode angket/kuesioner, pertanyaan dan studi dokumen. Instrumen yang digunakan dalam penelitian ini adalah kuesioner. Analisis data dalam penelitian ini menggunakan model analisis regresi sederhana dan regresi berganda. Hasil penelitian menunjukkan bahwa pertama, lingkungan belajar berpengaruh negatif dan signifikan terhadap literasi berhitung siswa kelas V SD. Keadaan lingkungan belajar di sekitar siswa cukup baik, namun respon berupa hasil belajar literasi numerasi yang dihasilkan rendah. Kedua, lingkungan belajar dan fasilitas belajar secara bersama-sama mempunyai pengaruh terhadap literasi berhitung siswa. Ketiga, lingkungan belajar dan fasilitas belajar secara bersama-sama berpengaruh negatif dan signifikan terhadap literasi berhitung.*

**A B S T R A C T**

The numeracy literacy of Indonesian students could be higher. Complete learning facilities can support the achievement of student learning outcomes. This study aims to analyze the effect of the learning environment and learning facilities on students' numeracy literacy. This type of research is quantitative with ex-post facto research methods with a survey design. The overall population consists of 24 state primary schools with a total of 523 students. The sampling technique uses cluster sampling. Methods of data collection through questionnaires/questionnaires, questions and document study. The instrument used in this research is a questionnaire. Data analysis in this study uses a simple regression analysis model and multiple regression. The results showed that the learning environment negatively and significantly affected the numeracy literacy of fifth-grade elementary school students. The state of the learning environment around students is quite good, but the response in the form of numeracy literacy learning results is low. Second, the learning environment and facilities influence students' numeracy literacy. Third, the learning environment and facilities negatively and significantly affect numeracy literacy.

## 1. INTRODUCTION

Literacy skills are currently a benchmark for the progress of a nation. Indonesia is one of the countries that actively participates in the international student assessment organized by the OECD (Organization for Economic Cooperation and Development) since 2001, namely PISA (Programme for International Student Assessment) which is carried out every three years. PISA aims to acquire information on knowledge and skills focusing on the areas of reading, math, and science (Habibi & Suparman, 2020; Nugrahanto & Zuchdi, 2019). Based on the latest PISA research in 2018, the mathematics ability of Indonesian children is relatively low, the score obtained is 379 with a rank of 72 out of 78 countries. Likewise, the TIMSS (Trends International Mathematics Science Study) assessment organized by the IEA (International Association for the Evaluation of Educational Achievement) every four years shows that Indonesia's mathematics score in 2015 was 397 with a rank of 44 out of 49 countries, the score is low when compared to the world score of 500. The low mathematical ability of students internationally illustrates that the numeracy literacy ability of Indonesian students is relatively low (Istiandaru et al., 2015; Umaroh & Pujiastuti, 2020). Mathematical literacy is very important because it can help a person to understand the role or use of mathematics in everyday life as well as use it to make decisions that are appropriate as citizens

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*Corresponding author.
E-mail addresses: ujang.efendi@fkip.unila.ac.id (Ujang Efendi)

who build, care, and think (Anwar, 2018; Habibi & Suparman, 2020). Good literacy skills can be one of the supports for students' Mathematics learning outcomes (Radiusman, 2020; Widiantari & Suparta, 2022). So that numeracy literacy skills are one aspect that needs to always be improved by going through the habituation process (Widiantari & Suparta, 2022; Winata et al., 2021).

Based on the results of the researcher's interview with the homeroom teacher V of SDN 2 Simpang Kanan on January 10, 2022, SDN 1 Margoyoso, SDN Argopeni, and SDN 1, information was obtained that during the pandemic, students learned at home by being directly controlled by educators. However, during the pandemic, student learning outcomes decreased (Fauzy & Nurfauziah, 2021; Safithri et al., 2021; Wiryanto, 2020). This occurs due to various factors during offline learning during the Covid-19 pandemic, ranging from the lack of learning facilities at home, the learning environment of students that is less effective and does not provide a sense of comfort to students, the lack of facilities and infrastructure in the learning process, and the delivery of material that cannot be understood correctly by students, especially mathematics.

At the time before the pandemic, by learning face-to-face with educators, students still found it difficult to understand the material, especially in a pandemic situation where they were only given a summary of the material and sample questions and then did the practice questions without explanation and without discussion. So, often those who do the assignment are their parents, older siblings or tutors and students just copy in the book the assignments that will be collected to the school without understanding the answer. Based on these results, researchers suspect that the learning facilities and learning environment of students that cause the numeracy literacy of class V students are not optimal. There are scores of students who are still below the Minimum Completion Criteria (KKM) that have been set by each school with details, there are 54% of students who are complete and 46% of students who have not been completed. This shows that students' mathematics learning outcomes are still low, low mathematics learning outcomes affect the numeracy of students.

The learning outcomes achieved by students are caused by many factors, both factors from within the individual and factors from outside the individual (Widiantari & Suparta, 2022; Yuniarti & Radia, 2020). Internal factors consist of physical factors, psychological factors and fatigue factors. While external factors consist of family factors, school factors, and community factors. The learning environment is one of the factors that come from outside (external) that can affect learning outcomes. To be able to learn well, a conducive learning environment is needed (Elsayed & Al-Najrani, 2021; Tanudjaya & Doorman, 2020). A student's learning environment can hinder the ongoing teaching and learning process, such as conditions at home crowded or not conducive and not supportive when the learning process takes place (Nurlaily et al., 2019; Whyte & Anthony, 2012).

A conducive learning environment greatly determines the success of student learning. In addition to the learning environment that can affect the numeracy literacy of students, there are other external factors that affect the numeracy literacy of students, namely learning facilities (Dina et al., 2019; Skagerlund et al., 2019; Uyen et al., 2019). The learning environment and learning facilities are factors that both come from outside the students which indirectly affect the improvement of student numeracy literacy. Adequate learning facilities will support students in achieving learning achievements such as the availability of reading books related to numeracy literacy (fiction, nonfiction, and reference), the availability of materials and instructions to make mathematics teaching aids that are easy to do, and the use of facilities at home for literacy displays (height measurement tools, room temperature thermometers, and interesting numbers) (Irfan et al., 2020; Tiwow et al., 2020). Previous research findings reveal that learning motivation and environment can improve Mathematics Learning Outcomes (Utaminingtyas et al., 2021). Other research findings also state that the learning environment influences learning outcomes in mathematics (Crismono, 2017; Hartanto & Sukartono, 2022). Based on this, this research aims to analyze the effect of the learning environment and learning facilities on students' numeracy literacy.

## 2. METHOD

This study aims to test hypotheses to describe and analyze the influence between existing variables, namely the influence of the learning environment (X1) and learning facilities (X2) on numeracy literacy (Y) of grade V students in elementary schools. This research is a quantitative research with ex-post facto method. Ex-post facto research is research where independent variables have occurred when researchers began to observe dependent variables (Sappaile, 2010). In ex-post facto research, researchers cannot manipulate variables. The researcher simply describes what happens to the independent variable and seeks information about the causal influence of the event. Data analysis in this study used simple regression analysis models and multiple regression. Simple regression is used to test hypotheses 1 and 2, namely the influence of the learning environment (X1) on student numeracy literacy (Y) and the effect of

learning facilities (X2) on student numeracy literacy (Y). While multiple regression analysis is used to test hypothesis 3, namely the influence of the learning environment (X1) and learning facilities (X2) together on the numeracy literacy of students (Y). This study used a sampling technique that only utilized a portion of the population. The population in this study is all grade V students of SD Negeri Sumberejo District, Tanggamus Regency. The overall population consists of 24 public elementary schools with 523 students. The sampling technique uses cluster sampling. Samples were selected from 24 public elementary schools consisting of 4 regions/clusters. Then the school to be used as a representative of each region / cluster to be a sample is selected using a simple random sampling technique. Data were obtained through questionnaire/questionnaire methods, questions and document studies.

The learning environment questionnaire (X1) was developed with three indicators, namely the learning environment at home, the learning environment at school and the learning environment in the community. The learning facility questionnaire (X2) was developed with four indicators, namely home study rooms or places, learning resources, learning aids, and learning equipment and equipment. The technique used to determine the validity of each questionnaire item is a validity test with the product moment correlation formula from Karl Pearson, while a reliability test with the Cronbach Alpha formula. Then, using classical assumption tests which include normality tests and linearity tests, hypothesis testing with simple and multiple linear regression analysis, all tests in this study were carried out utilizing the IMB SPSS 20 application.

## 3. RESULT AND DISCUSSION

### Result

Hypothesis testing is carried out to analyze the influence of the learning environment and learning facilities on the numeracy literacy of learners on the assumption that the results obtained are based on significant influence or not. The results of hypothesis testing can showed in Table 1.

**Table 1.** The Results of Hypothesis Testing

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 105.503 | 18.552 | | 5.687 | 0.000 |
| X1 | -0.741 | 0.210 | -0.325 | -3.521 | 0.001 |
| (Constant) | 92.198 | 17.758 | | 5.192 | 0.000 |
| X2 | -0.575 | 0.196 | -0.275 | -2.926 | 0.004 |
| (Constant) | 130.437 | 21.971 | | 5.937 | 0.000 |
| X1 | -0.608 | 0.217 | -0.267 | -2.799 | 0.006 |
| X2 | -0.408 | 0.199 | -0.195 | -2.045 | 0.043 |
| a. Dependent Variable: Y | | | | | |

Based on the data analysis presented in Table 1, it can be seen that the results of a simple regression test can be described that the regression coefficient of the learning environment variable (X1) is -0.741 which illustrates that the learning environment has a negative influence on the numeracy literacy of students. The results of a simple regression test can be described that the coefficient of regression of the learning facility variable (X2) is -0.575 which illustrates that learning facilities have a negative influence on the numeracy literacy of students. The results of the multiple regression test can be explained that the regression coefficient of the learning environment variable (X1) of -0.608 learning facilities (X2) of -0.408 which illustrates that the learning environment and learning facilities have a negative influence on the numeracy literacy of grade V elementary school students in Sumberejo District. Significance Calculation showed in Table 2.

**Table 2.** Significance Calculation

| Model | | F | Sig. |
|---|---|---|---|
| X1 | Regression | 12.397 | 0.001 |
| | Residual | | |
| | Total | | |
| X2 | Regression | 8.564 | 0.004 |
| | Residual | | |

| Model | | F | Sig. |
|---|---|---|---|
| X1^X2 | Total Regression Residual Total | 8.477 | 0.000 |

Based on the analysis of the data presented in table 3, it can be seen that the first hypothesis test was used to determine the influence of the independent variable (X1) on the dependent variable (Y). This test is carried out by comparing the Significance values. The calculation result obtained the value of Fhitung = 12.397 with a significance level of 0.001. Because the Sig value of 0.001 < 0.005, then Ho was rejected and Ha was accepted.  So it can be concluded that there is a significant influence of the learning environment on the numeracy literacy of grade V elementary school students in Sumberejo District. The second hypothesis test is used to determine the influence of the independent variable (X2) on the dependent variable (Y). This test is carried out by comparing the Significance values. From the calculation results obtained the value of Fhitung = 8.564 with a significance level of 0.004. Because the value of Sig 0.004 < 0.005, then Ho was rejected and Ha was accepted. So it can be concluded that there is a significant influence of learning facilities on the numeracy literacy of grade V elementary school students throughout Sumberejo District. The third hypothesis test is used to determine the influence of independent variables (X1) and (X2) on dependent variables (Y). This test is carried out by comparing the Significance values. From the calculation of SPSS 20 obtained the value of Fcount = 8.477 with a significance level of 0.000. Because the value of Sig 0.000 < 0.005, then Ho was rejected and Ha was accepted.  So it can be concluded that there is a significant influence of the learning environment and learning facilities together on the numeracy literacy of grade V elementary school students in Sumberejo District.

The coefficients of correlation and determination are used to force the influence between the learning environment and learning facilities on numeracy literacy. The calculation results of the coefficients of correlation and determination in Table 3.

**Table 3.** Analysis of the Coefficient of Determination

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| X1 | 0.325 | 0.106 | 0.097 | 23,506 |
| X2 | 0.275 | 0.075 | 0.067 | 23,900 |
| X1^X2 | 0.374 | 0.140 | 0.124 | 23,158 |

Based on the analysis of the data presented in Table 4, it can be seen based on the calculation of the coefficient of determination ($R^2$) variable X1 obtained a value of 0.106 which means 10.60% of the contribution of the influence of the learning environment on the numeracy literacy of students. Based on the calculation of the coefficient of determination ($R^2$) of variable X2, a value of 0.075 was obtained, which means 7.50% of the contribution of the influence of learning facilities on the numeracy literacy of students. Based on the calculation of the coefficient of determination ($R^2$) of variables X1 and X2 together, a value of 0.140 was obtained which means that the learning environment and learning facilities together have an influence of 14.00% on the numeracy literacy of students and the remaining 86.00% is influenced by other variables that are not studied.

**Discussion**

Based on data analysis, the learning environment has a negative and significant effect on the numeracy literacy of grade V elementary school students in Sumberejo District. It can be seen from the calculation results of a simple regression analysis that shows the value of the regression coefficient of the learning environment variable (X1) of -0.741 (sig<0.005, sig=0.001), meaning that the better the learning environment of students, the numeracy literacy ability of students will decrease. The results of this study were not in line with the expectations of researchers. Researchers propose a hypothesis that there is a positive influence of the learning environment on numeracy literacy, while based on the calculation results there is an influence but the results are not a positive effect but there is a negative and significant influence of the learning environment on the numeracy literacy of students in accordance with the regression equation that shows negative signs. The results showed that the learning environment had a negative and significant effect on the numeracy literacy of grade V elementary school students in Sumberejo District. The state of the learning environment around students is quite good, but the response in the form of numeracy literacy learning outcomes produced is low. The results of this study are not in line with previous researchers, based on data analysis and discussion, it can be concluded that there is a positive and

significant influence between the school environment on mathematics learning achievement (Buchanan et al., 2019; Turgut & Turgut, 2018). In this study, the learning environment of students has a negative effect, which means that the better the learning environment, the lower the numeracy literacy ability of students. Therefore, to improve student numeracy literacy, efforts must be made to improve the learning environment of students, so that student numeracy literacy will continue to increase with a good and conducive learning environment (Laurens et al., 2018; Sumarwati et al., 2020; Warshauer et al., 2021).

Based on data analysis, learning facilities have a negative and significant effect on numeracy literacy of grade V elementary school students in Sumberejo District. It can be seen from the calculation results of a simple regression analysis that shows the value of the regression coefficient of the learning facility variable (X2) of -0.575 (sig<0.005, sig=0.004), meaning that if learning facilities increase, numeracy literacy will decrease. The negative coefficient means that the effect of learning facilities on numeracy literacy is negative. The results of this study were not in line with the expectations of researchers. Researchers propose a hypothesis that there is a positive influence of learning facilities on numeracy literacy, while based on the calculation results there is an influence but the results are not a positive effect but there is a negative and significant influence of learning facilities on the numeracy literacy of students in accordance with the regression equation which shows negative signs. The results showed that learning facilities had a negative and significant effect on the numeracy literacy of grade V elementary school students in Sumberejo District.

The completeness of home learning facilities owned by students is quite good, but the response in the form of numeracy literacy learning outcomes produced is low. The influence of these negative learning facilities is not in line with previous researchers, based on the results of research on learning facilities that greatly affect the learning development of students (Hanesty et al., 2020; Siswanto & Hidayati, 2020; Sitirahayu & Purnomo, 2021). The learning facilities in question are tools used by students in helping their learning process such as study rooms, learning atmosphere, learning tools, lighting. Learning facilities greatly affect the learning achievement of students. Because the more complete the facilities they have, students can learn well. The results showed that the availability of learning facilities at home has an influence on student achievement (Asih, 2017; Hartanto & Sukartono, 2022; Ulfa & Mikdar, 2020). The more complete and feasible the learning facilities at home, the better the learning achievement of students. Similarly, there is a positive and significant influence between learning facilities and the learning achievement (Rahmawati et al., 2021; Widiarti et al., 2021).

Based on data analysis, the learning environment and learning fsdilitsd together have a negative and significant effect on the numeracy literacy of grade V elementary school students in Sumberejo District. It can be seen from the results of simple regression analysis calculations that show the value of the regression coefficient of the learning environment variable (X1) of -0.608 learning facilities (X2) of -0.408 (sig<0.005, sig = 0.000), meaning that the better the learning environment and learning facilities of students, the numeracy literacy ability of students will decrease. The results of this study were not in line with the expectations of researchers. The researcher proposed a hypothesis that there is a positive influence of the learning environment and learning facilities together on numeracy literacy, while based on the calculation results there is an influence but the results are not a positive effect but there is a negative and significant influence of the learning environment and learning facilities together on the numeracy literacy of students in accordance with the regression equation that shows negative signs. The results showed that the influence of the learning environment and learning facilities together on the numeracy literacy of grade V elementary school students proved negative and significant.

This study shows that the learning environment and learning facilities owned by students do not have a contribution in optimizing students' numeracy literacy skills. The influence of this negative learning environment and learning facilities, is not in line with previous researchers, the learning environment and learning facilities have a significant effect on student achievement in grade VIII social studies subjects at SMPN 1 Sambit Ponorogo with a percentage of 29.20%, this can be seen in factors such as, adequate school buildings, the presence of good air ventilation, facilities and infrastructure are quite good (Sholihah & Mufidah, 2021). The results showed a positive and significant relationship between the atmosphere of the learning environment and the Mathematical-Logical intelligence of grade V students of SD Negeri 1Tersobo, the relationship between the atmosphere of the learning environment and Mathematical-Logical intelligence is caused because the atmosphere of the learning environment is one of the supporting factors for learning success (Istirohah et al., 2022). The results of the study can be concluded that home learning facilities have a positive and significant effect on the learning achievement of high-class students of SD Inpres Tara-Tara 2 (Mandey, 2021). This research was conducted in public elementary schools throughout Sumberejo District, and has differences with relevant research in the form of the object of research conducted, dependent variables influenced and the year of research. Researchers concluded that the

learning environment and learning facilities together have a negative and significant effect on the numeracy literacy of grade V elementary school students in Sumberejo District.

## 4. CONCLUSION

Based on the findings and discussion, it can be concluded that first, the learning environment has a negative and significant effect on the numeracy literacy of students. Second, there is a negative and significant influence between learning facilities and numeracy literacy of students. Third, there is a negative and significant influence of the learning environment and learning facilities together on the numeracy literacy of grade V elementary school students in Sumberejo District. Suggestions for educators should pay attention to the learning atmosphere so that learning is more interesting, fun and not boring, pay more attention to students and use learning facilities well so that the teaching and learning process becomes more efficient. For this reason, it is hoped that students can make good use of learning facilities so that learning outcomes increase, including in numeracy literacy.

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