Jurnal Hurriah: Jurnal Evaluasi Pendidikan dan Penelitian
Hurriah Journal: Journal of Educational Evaluation and Research
Volume 6, No. 2 (2025) PP 744-751

Hurriah Journal: of Educational Evaluation and Researcl
Hurriah Journal: of Educational Evaluation and Researcl

Journal homepage: https://academicareview.com/index.php/jh
E-ISSN: 2774-8472 I P-ISSN: 2774-8480 I DOI : 10.56806

The Effect of Digital-based Literacy on Learning Outcomes of First Grade Students

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ARTICLE INFO

Article history:
Received May 2025
Received in revised from May 2025
Accepted June 2025
Available online June 28, 2025

Keywords:

Literacy, Learning Outcomes, Wordwall

ABSTRACT

This study aims to determine the effect of digital-based literacy using Wordwall Interactive Media on Learning Outcomes of grade I students of SD Negeri 1 Makarti Jaya. The subjects of this study were grade I students of SDN 1 Makarti Jaya. Data collection techniques in this study using tests and documents with Pre-Experimental design data testing type One-Group pretest-posttest. The results showed that the pre-test results obtained a minimum score of 10 and a maximum score of 70 with an average score of 42.97. while the post-test results obtained a minimum score of 70 and a maximum score of 100 with an average score of 90.27. While the independent sample t-test test in the SPSS version 26 programme obtained a significant value (2-tailed) of 0.000 <0.05, then H_o is rejected and H_a is accepted. So it can be concluded that there is a significant effect of Digital-based Reading and Writing Literacy skills on the Learning Outcomes of grade 1 elementary school students.

1. Introduction

Learning in elementary school in addition to teaching science also provides skills. The skills that are mastered are language skills, because language is important to express ideas or ideas that exist in the mind. There are four language skills, namely listening, speaking, writing, and reading (Navida et al., 2023). Literacy comes from the English word 'literacy', which means 'one who learns'. Literacy is not limited to the ability to write and read. Literacy is now linked to literacy in technology, science and information. Basically, a person's ability to read and write is very important to develop a broader meaning of literacy (Amri, & Rochmah, 2021). Literacy is an activity that is the focal point of progress to build life in a literate society to be much better, and through literacy we as individuals, communities and nations are not easily swayed by various information that comes over and over again (Kiranti, Selegi, & Lian, 2023). Another opinion also states that literacy is defined as the knowledge and ability to read and write, process and understand information during the reading and

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https://doi.org/10.56806/jh.v6i2.233

writing process, and the ability to analyse, respond to and use language. Literacy is developed and implemented based on five basic principles. The five basic principles of literacy development and implementation are wholeness and wholeness (holistic), integration, sustainability, contextuality and responsiveness to local wisdom. The literacy curriculum concept is often applied in schools to realise the antithetical literacy construct as an 'autonomous' skill (Suardipa, Putrayasa, & Wiguna, 2022).

According to Nidiana (2021), students have a character that is very familiar with technology, even known as digital native. Digital native means that the character of students is born and grows, grows up in direct contact with the digital world, so that students are very familiar with information technology, various information on the internet. This condition makes educators have a higher level of necessity to strengthen themselves and enable themselves to follow the skills of students, so that they are smooth in adapting to technology so that they are able to design learning with efficient and interesting time through website media references, or learning activation links through various references available on the internet.

Purnamasari, et al (2022) argue that Wordwall is an alternative choice from a variety of interactive learning media that can make the learning process fun and not boring for students and teachers. Because, this Wordwall application emphasises a learning style that involves the role of learning activities of students through participation with their peers competitively on the learning that is being or has been learned.

Learning outcomes are defined as the level of student success in learning subject matter at school expressed in the form of scores obtained from the results of tests knowing a certain amount of subject matter. In essence, learning outcomes are changes in a person's behaviour as a result of the learning process. These changes can be in the form of knowledge, understanding, skills and attitudes which are usually expressed in the form of numbers or letter symbols with predetermined criteria. The learning outcomes obtained by students can provide information about students' ability to understand the learning material explained by the teacher in the teaching and learning process in class (Irawati, Ilhamdi & Nasruddin, 2021).

The use of media in the learning process and student play activities must be designed and adjusted to what abilities will be developed. This means that it is necessary to create games that have academic content but still fulfil the criteria of play in children's perception. In this study, literacy skills are seen from games using Wordwall interactive media. Wordwall is one of the alternative choices from a variety of interactive learning media that can make the learning process fun and not boring for students and teachers. The Wordwall application emphasises a learning style that involves the role of learning activities of learners through participation with their peers competitively on the learning that is being or has been learned.

An interesting media is an important thing in learning, especially in low-grade learning, so that children will be more interested in doing learning activities both in the classroom and outside the classroom. When children are interested in the media used in the learning process, children's abilities will develop optimally. This is the case with the existence of learning media in the form of picture cards which are useful for attracting and motivating students' reading learning abilities.

Based on the description above, the purpose of this study is to determine the effect of digital-based reading and writing literacy skills on the learning outcomes of grade I elementary school students.

2. Methodology

The research method used in this study is an experimental method using Pre-Experimental design, because the sample is not randomly selected and uses 1 class. The design uses One-Group

Pretest-Posttest, which is a design that includes a pretest-posttest so that the effect of treatment can be calculated by comparing pretest-posttest values. Thus the results of the treatment can be known more accurately, because it can compare with the situation before being treated (Sugiono, 2019, pp. 128-129).

This research was conducted at SD Negeri 01 Makarti Jaya which is located at Jalan Shinta No.033, Lk II, Makarti Jaya District, Banyuasin Regency. This research was conducted in class I in the even semester of the 2024/2025 school year.

The sampling technique in this study is to use Nonprobability sampling technique with Total Sampling type (overall sample). Total sampling is a sampling technique where all members of the population are sampled. According to Sugiono (2019, p. 155) research conducted on populations under 100 should be done with Total Sampling, so that all members of the population are sampled as subjects studied or as respondents providing information. 37 students from class I SDN 1 Makarti Jaya were sampled in this study.

Techniques for collecting data called data collection techniques using tests and documentation. Test is a data collection technique by giving a set of questions to respondents with the intention of getting answers that are used as the basis for determining a numerical score (Mukhtazar, 2020, p. 83). In this study using two tests, namely pretest and posttest. Pre-test is a test conducted before treatment is given to measure students' reading and writing skills. Post-test is a test used after the treatment is given. The test used was an objective test of 10 items in the form of questions to answer and complete digital-based sentences using wordwall with the Match Up feature. Documentation means a way of collecting data by recording existing data, data collection techniques with documentation is data collection obtained through documents (Hardani, 2020, p. 149). Documentation is carried out in this study to provide images that support the research process and are equipped with information. Documentation in this study is a student test sheet in written form, a list of test scores, photos in the process of learning activities applying digital-based Literacy Reading and Writing (Wordwall).

The instrument validation technique uses content validation and construct validation. In this case, an expert judgment test is carried out by analysing the integration of the instrument lattice and test achievement indicators. In the lattice there are variables studied, indicators as benchmarks and item numbers (items) of questions or statements that have been translated from indicators (Sugiyono, 2024: 202). Expert judgment means expert validators consisting of lecturers and teachers. Researchers focused on Indonesian subjects, so the validators were Indonesian lecturers and teachers of SDN 01 Makarti Jaya. Validity for the preparation of good instruments must pay attention to theory and facts in the field, the data generated is a function of the design and instruments used. instruments in the form of tests that are often used to measure learning achievement, the instruments must be prepared based on the subject matter that has been taught (Sugiyono, 2024: 195). In internal validity, to determine the validity of an instrument is done by correlating the score of each variable with the total score significantly. The correlation technique used is the following Person (Product Moment) formula:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X^2)\}\{N\sum Y^2 - (N\sum Y^2)\}}}$$

Description:

$\boldsymbol{r_{xy}}$ = Correlation Coefficient r_{count}

N = Number of samples

∑X = Number of item scores

∑Y = Total number of items

The results of the validity test of this study use a significance level of 5% with the provisions: If, rxy ≥ rtable then it can be said that the instrument is valid, otherwise if rxy < rtable then it can be said that the instrument is invalid. From the results of the validity test with df = n-2 with a value of n = 20 (students), the validity test results are presented in the following table:

Question Number	r_{count}	r_{table}	Category
1	0,765	0,441	Valid
2	0,757	0,441	Valid
3	0,535	0,441	Valid
4	0,633	0,441	Valid
5	0,814	0,441	Valid
6	0,838	0,441	Valid
7	0,594	0,441	Valid
8	0,616	0,441	Valid
9	0,650	0,441	Valid
10	0,480	0,441	Valid

Tabel 1. Validity Test Data

Based on the results of the validity test analysis in the table that has been presented from 10 questions that have been tested on 20 students, the 10 questions are declared valid where r_{count} > r_{tabel} then the question is suitable for use in research.

Instrument reliability testing can be done externally or internally. Internally, the reliability of the instrument can be tested by analysing the consistency of the items on the instrument with certain techniques (Sugiyono, 2019, p. 218). After conducting the validity test, then the reliability test, the goal is to determine the consistency of the instrument as a measuring tool and the instrument can be trusted. To calculate reliability using the Alpha Crombach formula, as for the criteria for testing the validity of the instrument if $r_{i\ \text{count}}$ is greater than $r_{i\ tabel}$, then the instrument is declared reliable, otherwise if $r_{i\ \text{count}}$ is smaller than $r_{i\ tabel}$ then the instrument is declared unreliable with a significant level of 5%. (Kesumawati, 2023, p.38)

Table 2. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.850	10

From the table above obtained from calculations using SPSS version 26, it is known that there are N of items (the number of items) there are 10 items with a Cronbach Alpha value of 0.850. Because the Cronbach Alpha value is 0.850 ≥ 0.441, then, according to the reliability test decision-making criteria above, it can be concluded that the research instrument is declared reliable.

The level of difficulty is the opportunity to answer correctly and incorrectly a question in a certain ability which is usually expressed in the form of an index. This difficulty index is generally expressed in the form of a proportion of about 0.00-1.00 (Zainuri, 2021, p. 98).

Table 3. Data on Level of Difficulty

Question Number	Number of Correct	Questions Total Number of Students	Category Difficulty	Index
1	10	20	0,50	Medium
2	16	20	0,80	Easy
3	9	20	0,45	Medium
4	11	20	0,55	Medium
5	15	20	0,70	Medium
6	12	20	0,60	Medium
7	17	20	0,85	Easy
8	13	20	0,65	Medium
9	13	20	0,65	Medium
10	9	20	0,45	Medium

The differentiating power of the question is the ability of the question to distinguish students who are good (high ability) from students who are not (low ability). The number that shows the magnitude of the differentiating difference is called the discrimination index, abbreviated as D (Rahman, 2019, pp. 133-134).

Based on the results of the calculation data from 10 items of questions that were tested obtained a medium and easy category level. Based on this presentation, the data can be said that the resulting difficulty index is in the varied category.

Table 4. Differentiating Power Results

Number Question	Differentiating Power	Criteria
1	0,683	Good
2	0,692	Good
3	0,267	Fair
4	0,520	Good
5	0,753	Very good
6	0,779	Very good
7	0,500	Good
8	0,505	Good
9	0,549	Good
10	0,340	Fair

Based on the results of the differentiator test calculation above, it is obtained that there are 2 items categorised as sufficient, 6 items categorised as good and 2 items categorised as excellent.

3. Results Results and Discussion

This research was conducted in class 1 of SD Negeri 1 Makarti Jaya which only has 1 class 1 rombel, because the school lacks classrooms. This research was conducted using an experimental research design consisting of pretest and posttest. To determine student learning outcomes in Indonesian language subjects Chapter 5 material 'New Friends' given during the study. During the research activities students were given treatment using Wordwall interactive learning media on the Match-Up Feature. This study uses an objective question test instrument as many as 10 questions given to students to find out the results of the sample.

Table 5. Results Pretest

Descriptive Statistics

	N-	Min-	Max-	Mean	Std. Deviation
Nilai Pre-Test	37	10	70	42.97	18.688
Valid N (listwise)	37				

Table 6. Results Posttest

Descriptive Statistics

	N-	Min-	Max-	Mean	Std. Deviation
Nilai Pre-Test	37	70	100	90.27	11.177
Valid N (listwise)	37				

Based on the results of pre-test data taken during research activities in the experimental class, the minimum student score is 10 and the maximum score obtained is 70, with an average score of 42.97, and a standard deviation of 18.688. And the post-test results obtained the minimum student value is 70 and the maximum value obtained is 100, with an average value of 90.27 and a standard deviation of 11.177.

The normality test aims to determine whether the data population is normally distributed or not. This test uses the Kolmogorov-Smirnov test on the SPSS version 26 application programme.

Table 7. Normality Test Results of Pretest and Posttest data

Tests of Normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Nilai Pre-Test	.135	37	.088
Nilai Post-Test	.181	37	.072

a. Lilliefors Significance Correction

From the table above, it can be seen that the significant value of the pretest is 0.088> 0.05 and the significant value of the posttest is 0.072 = 0.05. Thus it is concluded that the data taken from the pretest and posttest scores of the experimental class are normal.

The purpose of this test is to determine whether the objects studied have the same variant or not. This test uses the Levene test on the SPSS version 26 application program. The homogeneity test of variance by applying Levene's testof homogeneity of variances is said to meet the assumption that the variance is homogeneous with the decision-making criteria, namely, if the significance value (sig) > 0.05 then the data is declared homogeneous. Conversely, if the significance value (sig) < 0.05 then the data is declared inhomogeneous.

Table 8. Homogeneity Test Results of Pretest and Posttest data

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	1.082	1	72	.302
	Based on Median	1.082	1	72	.302
	Based on Median and with adjusted df	1.082	1	57.176	.303
	Based on trimmed mean	1.237	1	72	.270

From the table above obtained from calculations using the SPSS version 26 programme, it is known that the significant value is 0.302. Because the significant value of 0.302> from 0.05, the data is declared homogeneous. Thus the homogeneity test decision-making criteria can be concluded that the data is declared homogeneous.

After the data meets the requirements, namely normal and homogeneous, the next test carried out is hypothesis testing. To test the hypothesis, researchers used the Independent Sample T-Test formula with the SPSS version 26 application programme.

Tabel 9. Hasil Uji Hipotesis

Independent Samples Test

		t	df	*Sig (2-tailed)*
Hasil Belajar	*Equal Variances Assumed*	13.371	72	0,000
	Equal Variances Not Assumed	13.371	58.748	0,000

From the table, it can be seen that hypothesis testing uses the Independent Sample T-Test test, the results of data analysis obtained by the Significant value (2-Tailed) is 0.000 < 0.05 then H_o is rejected and H_a is accepted. It can be concluded that there is an effect of digital-based literacy skills on the learning outcomes of grade I elementary school students.

4. Conclusions

Based on the data analysis conducted, it can be concluded that the ability of Digital-based Reading and Writing Literacy affects the Indonesian Language Learning Outcomes of grade I elementary school students. This is evidenced through hypothesis testing with the results of the average pretest value is 42.97 and the posttest value is 90.27, which shows that there is a significant difference in the average student learning outcomes. While the results of the independent simple t-test obtained a significant value (2-tailed) is 0.000 < 0.05, then H_o is rejected and H_a is accepted. So it can be concluded that there is a significant effect of Digital-based Reading and Writing Literacy skills on the learning outcomes of grade 1 elementary school students.

Acknowledgement

This research was not funded by any grant.

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