Effectiveness of digital storybooks based on Balinese culture for enhancing cultural-civic literacy and Pancasila education outcomes

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Abstract

The integration of local cultural content in educational materials has been increasingly recognized as an effective approach to enhance student engagement and learning outcomes. Empirical evidence on the specific impacts of digital storybooks based on local culture remains limited. This study aims to evaluate and determine the effectiveness of implementing digital storybooks based on Balinese local culture to enhance cultural civic literacy and learning outcomes of Pancasila education among fifth-grade elementary students. The effectiveness testing engaged 114 fifth-grade students in Jembrana Regency. The effectiveness analysis used multivariate analysis techniques and effect size transformation. The results show that digital storybooks demonstrated high effectiveness in enhancing cultural civic literacy and learning outcomes of Pancasila education. The effect size (ES) for cultural civic literacy was 0.849 indicating a high level of effectiveness. For Pancasila education learning outcomes, the effect size was 0.872 reflecting high effectiveness. When considering both cultural civic literacy and learning outcomes simultaneously, the effect size was 0.851 confirming the substantial impact of the digital storybooks. The conclusion suggests that digital storybooks based on Balinese local culture are highly effective tools for improving cultural civic literacy and Pancasila education learning outcomes. These results support the integration of local cultural content into educational materials.

Contents

Contribution of this paper to the literature
This study is original in its integration of Balinese cultural elements into digital storybooks to enhance both cultural civic literacy and Pancasila education outcomes. This study specifically addresses the dual impact on literacy and civic values within Indonesia's unique cultural framework.

1. Introduction

Pancasila education is a vital part of the Indonesian educational system aiming to instill the core values of Indonesia's foundational philosophy. Pancasila consists of the following five principles: Belief in the one and only God, promoting religious harmony and tolerance; just and civilized humanity; advocating for human rights and social justice; the unity of Indonesia; fostering national unity; democracy guided by inner wisdom supporting democratic consensus; and social justice for all and striving for equitable wealth distribution across society. This educational framework aims to foster students' understanding of their roles and responsibilities as citizens, thereby contributing to the development of a cohesive national identity and a well-functioning democratic society (Dewantara, Suhendar, Rosyid, & Atmaja, 2019; Fitriasari & Masyitoh, 2020). On the other hand, cultural civic literacy involves understanding and engaging with cultural and civic values essential for participating in a diverse and democratic society (Lestari & Ramadan, 2023; Maine, Cook, & Lähdesmäki, 2019). It encompasses the ability to comprehend and appreciate cultural identities and civic responsibilities which are critical in navigating the complexities of modern life and contributing to societal well-being. Pancasila education helps reinforce the principles of unity, democracy, and social justice are integral to cultural civic literacy.

A great nation is marked by its literate society which possesses high civilization and actively contributes to the advancement of the global community (Marmoah & Jenny Indrastoeti Siti Poerwanti, 2022). Literacy in this context is not merely about a nation's ability to eliminate illiteracy but more importantly, about its citizens' life skills that enable them to compete and collaborate with other nations to create global prosperity (Mokhtari, 2023). This aligns with the state of the Republic of Indonesia which has various diversities including ethnic, cultural, linguistic, and religious diversities. This results in diversity brought by each ethnic group entering Indonesia exacerbated by global developments (Ananta, Arifin, Purbowati, & Carnegie, 2023). The ability of citizens to know and understand the existing diversity is one of the skills that citizens must master in welcoming global changes in the 21st century.

Problems and challenges related to cultural literacy persist. According to the Programme for International Student Assessment (PISA) survey, Indonesia's literacy level is very low ranking 69th out of 76 countries (Ahsani, Luthfi, & Azizah, 2021). The prevalence of discrimination and sectarianism within Indonesian society highlights the issue of low cultural literacy. A survey conducted by Indonesia's National Commission on Human Rights in 2021 shows that 27.8% of respondents stated that they had experienced or witnessed discrimination. These issues indicate the low level of cultural literacy in Indonesia which is caused by low cognitive conditions towards culture (Ahsani et al., 2021; Ramadhani, Putri, Ramadhan, Maulida, & Muhliansyah, 2019). Many of the teaching materials used as supporting tools in the learning process are limited to textbooks and worksheets with limited teaching materials integrated with culture (Deswila, Kustati, Yusuf, & Harun, 2021). To address this issue, it is necessary to develop teaching materials integrated with cultural and civic literacy to support the learning process.

Observations conducted at Jembrana Regency Elementary Schools revealed several problems related to the issue. First, students often differentiate between genders. Second, some students do not care about traditions such as using the Balinese language when communicating with teachers or fellow students. The reasons for low cultural literacy among students include the lack of facilities and infrastructure supporting the learning process that can develop students' cultural literacy. Teachers predominantly use lecture methods in teaching without integrating cultural elements with learning media that can assist students in learning. There is also a lack of teacher competency development activities related to the use of innovative learning models or media that incorporate cultural elements which contributes to low cultural literacy among students.

Data from interviews with teachers and elementary school students in urban and rural areas of Jembrana Regency also support this observation. The results of interviews with fifth-grade teachers in schools in urban, rural, and remote areas of Jembrana Regency show that 1) not many teachers and principals are aware of students' cultural and civic literacy skills in elementary schools or how to measure them. 2) Some teachers have measured students' cultural and civic literacy skills but the results are still suboptimal. 3) The implementation of Pancasila education has been delivered orally and has not utilized media or learning models. 4) The learning outcomes of Pancasila education are not optimal. 5) Some students are less motivated during Pancasila education lessons because teachers do not use learning media, and 6) the learning resources used by teachers are limited to government-provided textbooks.

Based on these interview results, the learning process is still conducted conventionally and teachers have not used varied learning resources and media. This needs to be improved to create student-centered learning that activates students in the learning process. Students show more enthusiasm when learning involves the use of concrete learning media especially storybooks and show more interest when teachers invite them to read storybooks or watch videos (Al Kamil, Izzaty, & Patmawati, 2023; Gunawan, Suhardi, & Makawawa, 2023). Teachers also need more references to teaching materials and strategies to make learning more varied and interactive which aligns with students' enthusiasm for interactive media (Bilici & Yilmaz, 2024; Papadopoulou & Vlachos, 2014). Observations and interviews reveal that teachers are not yet aware of integrating cultural and civic literacy into the learning process especially using innovative media like storybooks.

The significance of this study lies in addressing the gap in empirical evidence on the effectiveness of educational tools that integrate local cultural content, specifically digital storybooks in enhancing both Pancasila education and cultural civic literacy. This research aims to evaluate the impact of digital storybooks based on Balinese culture on these educational outcomes given the low levels of cultural literacy and the suboptimal outcomes in Pancasila education observed in Indonesian schools (Ahsani et al., 2021). There is a need to develop

integrated teaching materials that incorporate cultural and civic literacy given the empirical findings and the challenges in cultural literacy. Storybooks for children integrated with CLIL (Content and Language Integrated Learning) can be an effective solution (Chou, 2022; Norhasanah & Setiawan, 2023; Sanad & Ahmed, 2017). Storybooks for children are efficient in instilling values and attitudes in students. The use of stories positively influences the development of children's moral values (Nurdini, 2019). Storybooks, integrated with other subjects can serve as a medium for learning and character-building (Aryawan, Suwastini, Artini, Jayantini, & Adnyani, 2022; Romadhianti, 2020). Stimulating students' literacy interests is also in line with the objectives of the school literacy movement in Indonesia.

The study seeks to answer the following questions: (1) How effective are digital storybooks based on Balinese local culture in improving cultural civic literacy among fifth-grade students? (2) To what extent do these digital storybooks enhance learning outcomes in Pancasila education ? This research aims to contribute to the development of more effective educational materials that address both cultural and civic literacy needs by exploring these questions. Therefore, the objective of the study is to test and analyze the effectiveness of implementing a Bali-based local cultural digital storybook to enhance cultural citizenship literacy and learning outcomes in Pancasila education for fifth-grade elementary school students in Jembrana Regency.

2. Literature Review
2.1. Cultural Civic Literacy
Literacy encompasses the ability to comprehend written texts, numbers and symbols in both printed and digital formats across various domains utilizing them to enhance personal and social well-being. The six core literacies include reading and writing, numerical literacy, scientific literacy, digital literacy, financial literacy, and cultural-civic literacy (Fitria, 2023; Tinmaz, Lee, Fanea-Ivanovici, & Baber, 2022). Cultural-civic literacy emphasizes understanding culture as part of national identity and citizenship as a responsibility to uphold rights and obligations, aiming to enhance both individual and societal quality of life (Lestari & Ramadan, 2023). It is also defined as the network of information that competent readers possess, enabling them to read a newspaper with adequate comprehension, grasp the implications, and connect the content with the unwritten context that provides meaning (Maine et al., 2019).

Cultural and civic literacy is closely related to the ability to understand and embody cultural values and rights and obligations as citizens, including rights and obligations towards oneself, others, and society as well as for national life (Kusnadi, 2022). Cultural and civic literacy is an individual's and society's ability to behave towards their social environment as part of a culture and nation. The goal of cultural and civic literacy skills is to face the global cultural influx that has the potential to erode local and national cultures and serve as a medium for understanding rights, obligations, roles and responsibilities in supporting the betterment of Indonesia, connect generations and ensure that Indonesian culture becomes an identity, thus preventing its extinction (Saleem & Ilyas, 2019; Septiani & Maftuh, 2020).

The alignment of Pancasila education with cultural civic literacy is essential for fostering students' abilities to navigate and contribute to a diverse society. Pancasila education reinforces principles of unity, democracy, and social justice which are fundamental to cultural civic literacy. This integration helps students understand how national values can be applied in their interactions with their cultural and social environments, thus supporting the development of a cohesive and democratic society (Ananta et al., 2023; Saleem & Ilyas, 2019). Such integration is crucial in addressing the challenges posed by global and local cultural changes ensuring that Indonesian culture remains a strong national identity while preparing students for active civic engagement.

2.2. Previous Studies
Several research studies related to the improvement of cultural literacy skills have been conducted by other researchers. Hartono, Kusumastuti, Pratiwinindya, and Lestar (2022) aimed to instill cultural literacy and creativity through dance learning to foster a love for one's culture among early childhood. The study found that the process of planting dance literacy through dance learning helped children understand various regional movements and songs, appreciate by performing movements and singing other regional songs, and unconsciously apply cultural knowledge in their lives. Regarding creativity, early childhood became skilled and fluent in dancing, graceful, expressive, and proficient in detailing movement sequences and imagining. The development of children's character through cultural literacy based on Nusa Tenggara Barat (NTB) Province folk tales was conducted by Inderasari et al. (2022). The results of the activity included the formation of storytelling training groups, the creation of NTB Folk Tale Books, participants recognizing NTB folk tales (70%), successfully implementing character values contained in NTB folk tales (84%), participants having good language skills (72%), high reading interest (86%), and participants being able to read fluently (75%). Another study on the educational game was conducted by Murti and Handayani (2022). Their findings indicated that the content validity score of the media was 0.98 (very valid), teacher responses were 100% (very valid), and student responses were 96.05% (very valid). The effectiveness analysis showed a result of 0.000 < 0.05 making the educational game suitable and effective for improving cultural literacy.

3. Method
3.1. Research Design
Effectiveness testing of cultural literacy and learning outcomes in Pancasila education for fifth-grade students will be conducted using a culturally based digital storybook from Bali. The use of culturally based digital storybooks from Bali is believed to instill and shape cultural literacy and citizenship skills while enhancing Pancasila education learning outcomes.

The research employs a quasi-experimental design with two groups: an experimental group using the digital storybook and a control group receiving traditional instruction. The research will focus on the following indicators:

a) Cultural literacy and Citizenship Skills: Understanding cultural complexities, awareness of one's own

culture, knowledge of citizenship duties and cultural sensitivity.
b) Pancasila Education Learning Outcomes: Cognitive outcomes such as appreciation of identity, respect for diversity, understanding benefits and challenges of diversity and attitudes towards maintaining diversity.

3.2. Research Population

The study involves fifth-grade students from three elementary schools in Jembrana Regency which are State Elementary School (SES) 1 Baler Bale Agung, SES 5 Baluk, and SES 6 Dauhwaru. Each school contributes two classes: one experimental group and one control group. Each class consists of 28 students.

3.3. Instrument

Test instruments are a form of written assessment to record or observe student achievements aligned with assessment targets (Harahap, Sembiring, Lubis, Nasution, & Dalimunthe, 2023). There are instruments for measuring both affective and psychomotor domains which can be referred to as non-test instruments in addition to instruments that can be used for cognitive measurement (Harahap et al., 2023). The non-test method was also applied to the mentioned experimental group. Test instruments consist of
a) Cultural and Citizenship Literacy Instrument Grid: Assesses students' understanding of cultural and citizenship complexities, self-awareness, citizenship obligations, and cultural sensitivity. This is evaluated through a set of indicators and sub-indicators listed in Table 1.
b) Pancasila Education Learning Outcomes Instrument Grid: Measures cognitive outcomes related to students' discipline, respect for diversity, understanding of the benefits and challenges of diversity, and behaviors impacting diversity as detailed in Table 2.

Table 1. Grid of cultural and citizenship literacy aspects.

No.	Indicators	Sub-indicators	Number of items		Total items
			Positive	Negative	
1	Understanding the complexity of culture and citizenship.	Identify diverse aspects of culture such as traditions, language, food, clothing, and art in society.	1 and 2	3	3
		Explain how different aspects of culture affect daily life and social interaction.	4 and 5	6	3
2	Knowing your own culture.	Able to describe and explain cultural elements of their own group or community.	7 and 8	9	3
		Identify their group's distinctive traditions, values, norms, and cultural practices.	10 and 11	12	3
3	Knowing citizenship obligations.	Able to outline basic rights and obligations such as citizens in society.	13 and 14	15 and 16	4
		Identify and explain the active role in maintaining social order and contributing to the progress of the country.	17 and 18	19	3
4	Concern for culture	Understand the importance of preserving and respecting one's own culture and the culture of others.	20 and 21	22	3
		Demonstrate a positive attitude and concern for other cultures and values of society.	23 and 24	25	3

Table 2. Grid of Pancasila education learning outcomes.

Indicators	Sub-indicators	Item number	Number of items
Students can apply a disciplined attitude in applying the norms in society and know the types of norms, sources and sanctions given in society and can apply them in daily life.	Students are able to apply a disciplined attitude in daily life.	1 and 2	7
	Students know the norms, sources and sanctions given in daily life.	3,4,5,6 and 7	
Students can apply a disciplined attitude in applying the norms that apply in society and know the types of norms, sources and sanctions given in society and can apply them in daily life.	Students can apply a disciplined attitude in applying the norms that apply in society.	8,9,10,11, 12,13,14 and 15	8
Students can behave in a way that respects the diversity in their environment as a form of attitude to face the challenges and advantages of a diverse life.	Students can appreciate and be grateful for the diversity in their environment as a gift from God Almighty.	16,17 and 18	5
	Students are able to believe and appreciate cultural diversity in their environment.	19 and 20	
Students can outline the advantages and challenges of living in diversity.	Students can outline the advantages and challenges of diversity in their environment.	21,22,23 and 24	4
Students can talk about attitudes and behaviors that can maintain or damage diversity in their environment.	Students are able to analyze attitudes that can maintain and damage diversity in daily life.	25 and 26	6
	Students are able to apply the meaning of diversity in daily life.	27	
	Students are able to understand the meaning of diversity.	28 and 29	
	Students have a sense of sensitivity, tolerance, and respect for existing religious, cultural and racial differences.	30	
Total question items			30

3.4. Validity and Reliability Tests

The validity of the content of an item can be proven by using Content Validity Ratio (CVR) and Content Validity Index (CVI) or Aiken's V coefficient. CVR and CVI were proposed by Lawshe (1975) using 3 rating scales. These details can be seen from the validity standards that are influenced by the number of raters and the rating scale used (Bashooir & Supahar, 2018). The use of proof must consider the assumptions or conditions that must be met, whereas proof of validity using the concept of Lawshe only uses three rating scales, namely (1) essential, (2) useful but not essential, and (3) unnecessary (Dalawi, Isa, Chen, Azhar, & Aimran, 2023; Jeldres, Costa, & Nadim, 2023). The criteria for the validity of the content of the rubric items use a reference for the minimum CVR value based on the number of assessors. Item content is declared valid if it has a CVR $\geq$ 0.60. Proof of the validity of the content by Lawshe can be determined by the formula Equation 1:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}} \qquad (1)$$

Where n_e = The number of SMEs (Subject Matter Experts) who assess an 'essential' item and N = the number of SMEs conducting assessments.

All instruments used in this study are first validated by experts who have been determined. Then the validator agreement or CVR is calculated with the formula from Ayre and Scally.

All instruments used in this study were declared valid and could be used based on the results of the CVR calculation. Instrument reliability is seen from the amount of Cronbach's alpha reliability coefficient calculated using SPSS. In this case, the reliability standard of the instrument follows Kerlinger's theory, namely reliability or reliability is at least 0.70. The reliability of a test device can be seen from the amount of the reliability coefficient of the student test device using Cronbach's alpha formula (Maulana, 2022).

The validity and reliability tests were conducted on instruments that had been previously validated by experts. The validity test for the cultural civic literacy instrument was performed by comparing the calculated r value with the r value from the table, using a degree of freedom (df) of n-2 and a 5% margin of error. According to the r table, the critical value for df = 48 and an error rate of 5% is 0.2787. Any statement with a calculated r value greater than 0.2787 was deemed valid. The validity test results showed that the Pearson's Correlation (r_cal) for all statements exceeded 0.2787 indicating their validity for research purposes. Furthermore, the Cronbach's alpha value was 0.927 which is higher than the 0.70 threshold confirming the questionnaire's reliability.

3.5. Data Analysis

The normality test proves the distribution of data on cultural citizenship literacy and learning outcomes. If the data distribution is normal, parametric statistical tests can be applied. The Kolmogorov-Smirnov analysis is used to determine if the score distribution for each group is normal. The criterion is that data has a normal distribution if the sig. value > 0.05. The homogeneity of variance test is conducted to ensure that the data distribution across several groups is homogeneous. Homogeneity means that the data sets have similar characteristics. This test uses Levene's test of equality of error variance. The test is performed at a 5% significance level (α = 0.05). If the sig. value > the specified α, all groups have homogeneous variance. After the assumption tests are conducted and appropriate for balanced sample groups with normally distributed samples and originating from a homogeneous population, the hypothesis test is then performed. A correlation test is conducted to identify the level of relationship between the dependent variables. This test is carried out using the product moment test at a 5% significance level. If the test results show no correlation between the dependent variables, a multivariate test is conducted.

The effectiveness of the storybook can be determined by the improvement in cultural and citizenship literacy and students' learning outcomes after participating in lessons using the Balinese local culture-based digital storybook developed in this study. The statistical analysis used for hypothesis testing is MANOVA. This study analyzes the influence of one independent variable on two dependent variables according to the design in Table 3 whereas A1 is learning with a Balinese local culture-based digital storybook, A2 is learning without a Balinese local culture-based digital storybook, Y1 is cultural and citizenship literacy ability and Y2 is learning outcomes.

Table 3. Data analysis design.

A1		A2	
Y1	Y2	Y1	Y2

Hypothesis 1 states that the implementation of the Balinese local culture-based digital storybook effectively enhances the cultural and citizenship literacy of fifth-grade elementary school students in Jembrana Regency. The statistical hypothesis is as follows:

H0: μ A1 Y1 = μ A2 Y1.
H1: μ A1 Y1 ≠ μ A2 Y1.
Whereas
μ A1 Y1: Cultural and citizenship literacy ability scores of students learning with the Balinese local culture-based digital storybook.
μ A2 Y1: Cultural and citizenship literacy ability scores of students learning without the Balinese local culture-based digital storybook.

Hypothesis 1 is tested through ANOVA with variance statistics (F-test). The test criterion is decided if the F value is sig. < 0.05, then H0 is rejected meaning that the implementation of the Balinese local culture-based digital storybook effectively enhances the cultural and citizenship literacy of fifth-grade elementary school students in Jembrana Regency.

Hypothesis 2 states that the implementation of the Balinese local culture-based digital storybook effectively enhances the Pancasila education learning outcomes of fifth-grade elementary school students in Jembrana Regency. The statistical hypothesis is as follows:

H0: μ A1 Y2 = μ A2 Y2.

H1: μ A1 Y2 ≠ μ A2 Y2.

Whereas

μ A1 Y2: Learning outcomes scores of students learning with the Balinese local culture-based digital storybook.

μ A2 Y2: Learning outcomes scores of students learning without the Balinese local culture-based digital storybook.

Hypothesis 2 is tested through ANOVA with variance statistics (F-test). The test criterion is decided if the F value is sig. < 0.05, then H0 is rejected meaning that the implementation of the Balinese local culture-based digital storybook effectively enhances the Pancasila education learning outcomes of fifth-grade elementary school students in Jembrana Regency.

Hypothesis 3 states that simultaneously, the implementation of the Balinese local culture-based digital storybook effectively enhances both cultural and citizenship literacy and the Pancasila education learning outcomes of fifth-grade elementary school students in Jembrana Regency. The statistical hypothesis is as follows:

H0: μ A1 Y1 = μ A2 Y1.

    μ A1 Y2 = μ A2 Y2.

H1: μ A1 Y1 ≠ μ A2 Y1.

    μ A1 Y2 ≠ μ A2 Y2.

Whereas

μ A1 Y1: Cultural and citizenship literacy ability scores of students learning with the Balinese local culture-based digital storybook.

μ A1 Y2: Learning outcomes scores of students learning with the Balinese local culture-based digital storybook.

μ A2 Y1: Cultural and citizenship literacy ability scores of students learning without the Balinese local culture-based digital storybook.

μ A2 Y2: Learning outcomes scores of students learning without the Balinese local culture-based digital storybook.

Hypothesis 3 is tested with an F-test through MANOVA according to the test criterion of sig. F = 5%. The decision is determined through Pillae's Trace and Roy's Largest Root analysis.

If the sig. F calculated value ≤ 0.05, then the null hypothesis is rejected, meaning that simultaneously, the implementation of the Balinese local culture-based digital storybook effectively enhances both cultural and citizenship literacy and the Pancasila education learning outcomes of fifth-grade elementary school students in Jembrana Regency.

Improvement in students' cultural and citizenship literacy and learning outcomes during the learning process is not easily expressed using absolute gain (the difference between pre-test and post-test scores). This does not sufficiently explain which is categorized as high gain and which is categorized as low gain, therefore, it is necessary to find the Normalized Gain Score (GSn) (Liana, Muzzazinah, & Meti, 2022; Nissen, Talbot, Thompson, & Van Dusen, 2016).

The Normalized Gain Score (GSn) is formulated in Equation 2.

$$GSn = \frac{Post\ test\ Score - Pre\ test\ Score}{Max\ Score - Pre\ test\ Score} \qquad (2)$$

After obtaining the Normalized Gain Score (GSn), the effect size is then calculated using the formula shown in Equation 3.

$$Es = t\ x\ \sqrt{\frac{1}{n1} + \frac{1}{n2}} \qquad (3)$$

The effectiveness level of the teaching materials used is presented in Table 4 (Cumming, 2014; Dantes, 2012; Sullivan & Feinn, 2012).

Table 4. Conversion guide for digital storybook effect size.

Score range	Effect size classification
Es < 0.20	Low
Es < 0.80	Medium
Es ≥ 0.80	High

4. Results and Discussion

The effectiveness of implementing digital storybooks was tested through statistical analysis of the data on cultural and citizenship literacy (Y1) and learning outcomes (Y2). Analysis includes: 1) descriptive statistical analysis (statistical data on cultural and citizenship literacy and learning outcomes in the experimental and the control groups, 2) prerequisite analysis tests (data distribution normality test, group variance homogeneity test, variance matrix homogeneity test, and inter-variable correlation test), and 3) inferential statistical analysis with MANOVA and independent t-test. The data analyzed are the gain score values (Normalized Gain-score). The results are presented sequentially.

4.1. Results of Descriptive Statistical Analysis

The results of the descriptive analysis of the experimental and the control groups on the variables of cultural and citizenship literacy and learning outcomes are presented in Table 5.

Table 5. Descriptive statistical data analysis results.

Descriptive statistics	A1Y1	A1Y2	A2Y1	A2Y2
N	57	57	57	57
Average	0.42	0.47	0.06	0.45
Median	0.43	0.55	0.20	0.50
Modus	1	0.667	-0.056	0.818
Std. deviation	0.411	0.343	0.617	0.355
Variance	0.169	0.117	0.381	0.126
Skewness	-1.166	-1.174	-0.897	-0.761
Kurtosis	2.077	1.893	0.407	-0.003
Range	2.000	1.600	2.576	1.500
Maximum	1	1	0.91	1
Minimum	-1	-0.6	-1.67	-0.5
Sum	23.759	26.914	3.6	25.62

Note: A1 = Experimental group.
A2 = Control group.
Y1 = Cultural citizenship literacy.
Y2 = Learning outcomes.

The descriptive statistical analysis of cultural citizenship literacy data shows that the experimental group (A1Y1) has a mean of 0.417 with a standard deviation of 0.410 while the control group (A2Y1) has a mean of 0.063 and a standard deviation of 0.416. For learning outcomes, the experimental group (A1Y2) recorded a mean of 0.472 with a standard deviation of 0.343 compared to the control group (A2Y2) which had a mean of 0.450 and a standard deviation of 0.025.

4.1.1. Frequency Distribution of Cultural-Citizenship Literacy of Students in the Experimental Group

The frequency distribution of cultural citizenship literacy for the experimental group is detailed in Table 6. This table presents the frequency distribution of cultural citizenship literacy for both the experimental group and the control group based on the normalized gain score.

Table 6. Frequency distribution of cultural citizenship literacy in the experimental and control groups.

Score	Category	Trial/Experiment (A1Y1)		Comparator/Control (A2Y1)	
		Fo	Percentage	Fo	Percentage
(g) > 0.70	High	16	28.1	7	12.3
$0.30 \leq (g) \geq 0.70$	Medium	22	38.6	18	31.6
(g) < 0.30	Low	19	33.3	32	56.1

Note: g = Normalized gain score.

For the experimental group (A1Y1), the distribution is 16 students (28.1%) in the high category, 22 students (38.6%) in the medium category, and 19 students (33.3%) in the low category. This indicates that most students fall into the medium and low categories, totaling 71.9%. Meanwhile, for the control group (A2Y1), the distribution is 7 students (12.3%) in the high category, 18 students (31.6%) in the medium category, and 32 students (56.1%) in the low category. This shows that most students fall into the medium and low categories, totaling 87.7%. In the high category, the experimental group has a higher percentage than the control group, with 28.1% in A1Y1 compared to 12.3% in A2Y1. Figure 1 presents the comparison of the distribution between A1Y2 and A2Y2.
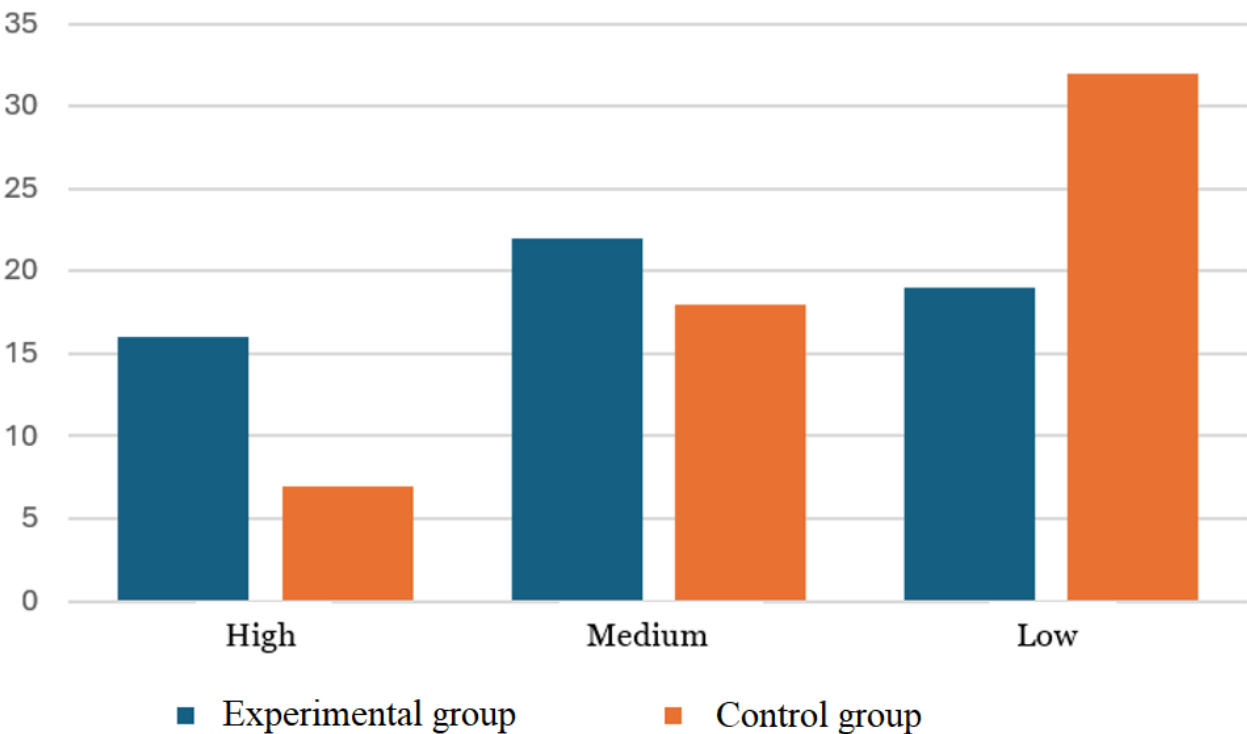

Figure 1. Bar chart of cultural citizenship literacy data for the experimental and control groups.

Figure 1 shows a comparison of cultural citizenship literacy data between A1Y1 and A2Y1, with A1Y1

outperforming A2Y1. In the high category, A1Y1 has more students than A2Y1. Similarly, in the low category, A1Y1 surpasses A2Y1, as there are fewer students in the low category for A1Y1 compared to A2Y1.

4.1.2. Frequency Distribution of Learning Outcomes of Students in the Experimental Group

The frequency distribution of learning outcomes for the experimental group is presented in Table 7. This table illustrates the frequency distribution of learning outcomes for both the experimental group (A1Y2) and the control group (A2Y2) based on the normalized gain score (g).

Table 7. Frequency distribution of learning outcomes in the experimental group and the control group.

Score	Category	Trial/Experiment (A1Y2)		Comparator/Control (A2Y2)	
		Fo	Percentage	Fo	Percentage
(g) > 0.70	High	15	26.3	13	22.8
$0,30 \leq (g) \geq 0.70$	Medium	26	45.6	22	38.6
(g) < 0.30	Low	16	28.1	22	38.6

Note: Explanation:
g = Normalized gain score.

For the experimental group (A1Y2), the distribution is 26 students (45.6%) in the medium category, 15 students (26.3%) in the high category, and 16 students (28.1%) in the low category. This indicates that most students fall into the medium and low categories, totaling 73.7%. Meanwhile, for the control group (A2Y2), the distribution is 22 students (38.6%) in the medium category, 13 students (22.8%) in the high category, and 22 students (38.6%) in the low category. This shows that most students fall into the medium and low categories, totaling 77.2%. In the high category, the experimental group has a higher percentage than the control group, with 26.3% in A1Y2 compared to 22.8% in A2Y2. Figure 2 presents the comparison of the distribution between A1Y2 and A2Y2.
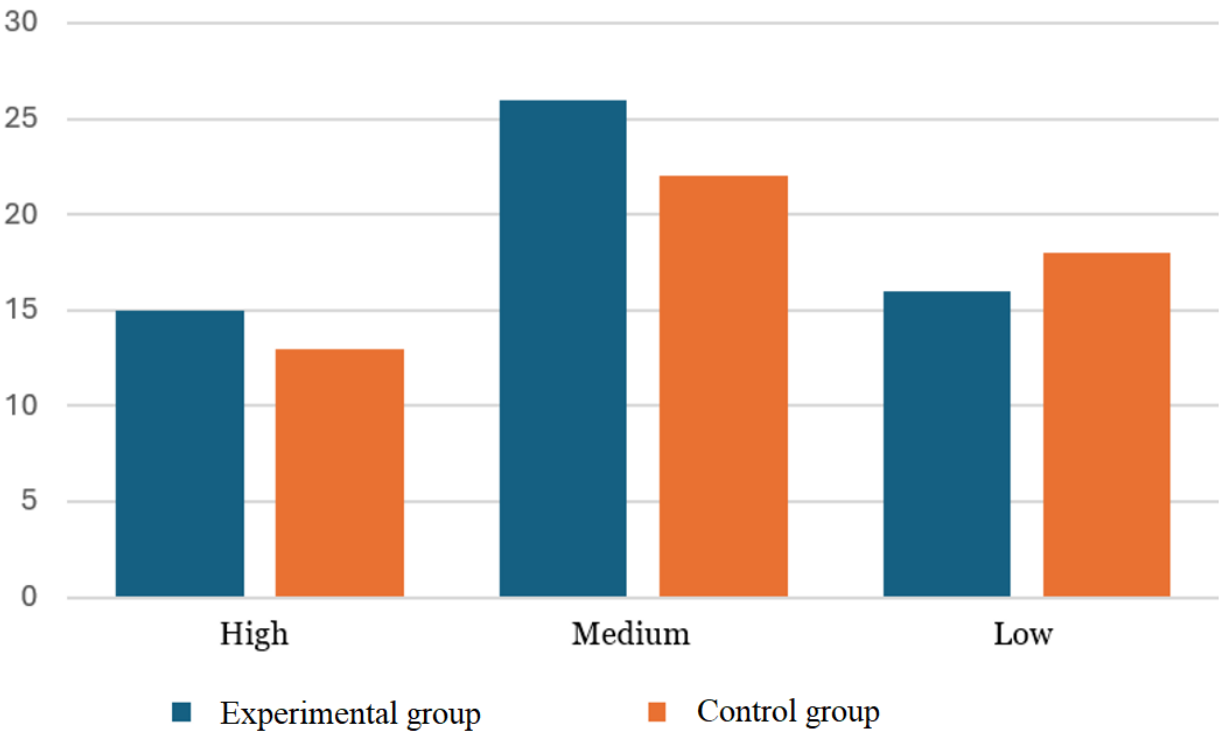

Figure 2. Bar chart of learning outcomes data for the experimental and the control groups.

According to Figure 2, the comparison of learning outcomes between A1Y2 and A2Y2 is evident. A1Y2 outperforms A2Y2 having a greater number of students in the high category. Additionally, A1Y2 also better in the low category with fewer students in this category compared to A2Y2.

4.2. Results of Prerequisite Analysis Testing

Before conducting the MANOVA analysis, prerequisite tests were carried out to assess normality of data distribution, homogeneity of variance and covariance matrices, and multicollinearity. Table 8 shows the results of the normality test. The Kolmogorov-Smirnov test produced a significance value greater than 0.05 meaning that H0 is accepted confirming that all data groups are normally distributed.

Table 8. Results of the data distribution normality test.

Groups	Standard deviation	N	Sig.
A1Y1	0.410	57	0.074
A2Y1	0.343	57	0.077
A1Y2	0.417	57	0.064
A2Y2	0.025	57	0.060

Table 9 presents the results of the group homogeneity test. Levene's test of equality of error variances was used to assess variance homogeneity, and the significance values obtained were greater than 0.05. Therefore, H0 is accepted, indicating that the variances for the cultural citizenship literacy (Y1) and learning outcomes (Y2) data are homogeneous.

Table 9. Results of variance homogeneity test.

Dependent variables		Levene statistic	df1	df2	Sig.
Y1	Based on the mean	2.960	1	112	0.088
	Based on the median	3.005	1	112	0.086
	Based on the median and with adjusted df	3.005	1	111.405	0.086
	Based on the trimmed mean	3.103	1	112	0.081
Y2	Based on the mean	0.497	1	112	0.482
	Based on the median	0.583	1	112	0.447
	Based on the median and with adjusted df	0.583	1	110.039	0.447
	Based on the trimmed mean	0.480	1	112	0.490

The results of the covariance matrix homogeneity test are presented in Table 10. The results of the covariance matrix test on the data show a Box's M value of 3.688, an F value of 1.205 and a sig. value of 0.306. Given the sig. value of 0.306 > 0.05, H0 is accepted indicating that the covariance matrices between the cultural citizenship literacy (Y1) and cultural citizenship literacy (Y2) variables are homogeneous.

Table 10. Box's test of equality of covariance matrices

Description	Volume
Box's M	3.688
F	1.205
df1	3
df2	2257920.000
Sig.	0.306

Table 11 presents the results of the multicollinearity test between dependent variables. The calculated r value of 0.346, which is less than 0.8, for the relationship between the cultural citizenship literacy (Y1) and learning outcomes (Y2) variables indicates that there is no multicollinearity.

Table 11. Results of multicollinearity test.

Variables		Y1	Y2
Y1	Pearson correlation	1	0.346**
	Sig. (2-tailed)	-	<.001
	N	114	114
Y2	Pearson correlation	0.346**	1
	Sig. (2-tailed)	<.001	-
	N	114	114

Note: ** indicates statistical significance at p < 0.01.

Based on the conducted prerequisite tests, it can be concluded that all necessary conditions for data analysis have been satisfied. The tests for data distribution normality confirmed that the data sets are normally distributed which is crucial for accurate statistical analysis. Additionally, the variance homogeneity tests, including Levene's test of equality of error variances indicated that the variances across the groups are consistent ensuring the reliability of comparisons between groups. The covariance matrix homogeneity test further supported the appropriateness of the data for multivariate analysis. Lastly, the multicollinearity test results showed no significant multicollinearity between the dependent variables, ensuring that the relationships among variables are not excessively redundant. Therefore, the data is suitable for further analysis including MANOVA as all prerequisite conditions have been adequately met.

4.3. Effectiveness of Using Digital Storybooks Based on Bali Local Culture on the Cultural Citizenship Literacy of Fifth-Grade Students in Jembrana Regency

Concerning the implementation of Bali local culture-based digital storybooks on cultural citizenship literacy, the first hypothesis examined in this study is $H_o: \mu 1A1Y1 = \mu 2A2Y1$ *(the implementation of digital storybooks based on Bali local culture is not effective in improving the* cultural citizenship literacy *of fifth-grade students in Jembrana Regency.)*

$H_a: \mu 1A1Y1 \neq \mu 2A2Y1$ *(the implementation of digital storybooks based on Bali local culture is effective in improving the* cultural citizenship literacy   *of fifth-grade students in Jembrana Regency.)*

The first hypothesis was assessed using a one-way ANOVA. The null hypothesis (Ho) is rejected when the F value's significance level is below 0.05 based on the testing criteria. Table 12 presents the results showing an F value of 43.272 with a significance level of < 0.001 for the dependent variable, cultural citizenship literacy. Consequently, Ho is rejected demonstrating that the use of Bali local culture-based digital storybooks effectively improves the cultural citizenship literacy of fifth-grade students in Jembrana Regency.

Table 12. Results of one-way ANOVA for cultural citizenship literacy.

Source of variation	Sum of squares	df	Mean square	F	Sig.
Between groups	898.302	1	898.302	43.272	<0.001
Within groups (Error)	2325.035	112	20.759	-	-
Total (Residual)	3223.337	113	-	-	-

The t-value for cultural citizenship literacy derived from the square root of the MANOVA F value (tAY1: square root of 43.272) is 6.578 with a two-tailed significance value of < 0.001. This indicates a significant difference in cultural citizenship literacy between the experimental group (A1) and the control group (A2), where

the mean Y1A1 is 0.417 compared to Y1A2 at 0.063. This suggests that using Bali local culture-based digital storybooks is more effective in enhancing cultural citizenship literacy than learning without such storybooks. This conclusion is supported by an effect size (ES) of 0.849 which denotes high effectiveness. The ES value is computed using the formula provided in Eq.4.

$$\Delta = \frac{Y_E - Y_C}{S_C} \qquad (4)$$

Δ = Effect size (ES).
Y_E = Mean value of the experimental group.
Y_C = Mean value of the control group.
S_C = Mean standard deviation of the control group.
In this case, ES AY1 = (0.417-0.063)/0.416, resulting in an ES value of 0.849 (high effectiveness category).

4.4. Effectiveness of Learning Using Digital Storybooks Based on Balinese Local Culture on the Learning Outcomes of Grade V Elementary School Students in Jembrana Regency

Concerning the impact of digital storybooks based on Balinese local culture on student learning outcomes, the second hypothesis formulated in this study is as follows:

H_o: $\mu 1A1Y2 = \mu 2A2Y2$ *The Implementation of digital storybooks based on Bali local culture is not effective in improving the learning outcomes of Grade V elementary school students in Jembrana Regency.*

H_1: $\mu 1A1Y2 \neq \mu 2A2Y2$ *The Implementation of digital storybooks based on Bali local culture is effective in improving the learning outcomes of Grade V elementary school students in Jembrana Regency.*

The second hypothesis is tested using a one-way ANOVA. According to the test criteria, the null hypothesis (Ho) is rejected if the F significance level is less than 0.05. The outcomes of the hypothesis analysis for this study are detailed in Table 13 which provides the statistical evidence supporting the effectiveness of the intervention.

Table 13. Results for ANOVA one path student learning outcomes.

Source of variation	Sum of squares	df	Mean square	F	Sig.
Between groups	8253.168	1	8253.168	80.547	<0.001
Within groups (Error)	11476.019	112	102.464	-	-
Total (Residual)	19729.187	113	-	-	-

The student learning outcomes variable yielded an F value of 80.547 with a significance level of less than 0.001 resulting in the rejection of the null hypothesis (H0) and the acceptance of the alternative hypothesis (H1). This confirms that digital storybooks based on Balinese local culture effectively enhance the learning outcomes of grade V elementary school students in Jembrana Regency.

The t-value for student learning outcomes is derived from the square root of the MANOVA F value (t AY2: $\sqrt{80.547}$) resulting in 8.975. The two-tailed significance value is less than 0.001 indicating a significant difference in learning outcomes(Y2) between the experimental group (A1) and the control group (A2) with a mean of 0.472 for Y2A1 compared to 0.450 for Y2A2. This demonstrates that using digital storybooks based on Balinese local culture is more effective in improving learning outcomes than traditional methods. This is further supported by an effect size (ES) of 0.872 which falls into the high effectiveness category calculated as ES AY2 = (0.472 - 0.450) / 0.025.

4.5. Effectiveness of Learning using Digital Storybooks based on Bali Local Culture Simultaneously on Cultural-Citizenship Literacy and Learning Outcomes of Fifth-Grade Students in Jembrana Regency

Regarding the combined impact of digital storybooks based on Balinese local culture on both cultural citizenship literacy and student learning outcomes, the third hypothesis examined in this study is as follows:

H_o: $\mu 1A1Y2 = \mu 2A2Y2$ (*simultaneous implementation of digital storybooks based on Bali local culture is not effective in improving cultural citizenship literacy and student learning outcomes of fifth-grade students in Jembrana Regency*).

H_1: $\mu_1 A_1 Y_2 \neq \mu_2 A_2 Y_2$ (*simultaneous implementation of digital storybooks based on Bali local culture is effective in improving cultural citizenship literacy and student learning outcomes of fifth-grade students in Jembrana Regency*).

The third hypothesis was evaluated using MANOVA incorporating multiple multivariate statistics including Pillai's Trace, Wilk's Lambda, Hotelling's Trace, and Roy's Largest Root as detailed in Table 14.

Table 14. Multivariate test results.

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's trace	0.998	25386.478[b]	2.000	111.000	<0.001
	Wilks' lambda	0.002	25386.478[b]	2.000	111.000	<0.001
	Hotelling's trace	457.414	25386.478[b]	2.000	111.000	<0.001
	Roy's largest root	457.414	25386.478[b]	2.000	111.000	<0.001
Group	Pillai's trace	0.523	60.904[b]	2.000	111.000	<0.001
	Wilks' lambda	0.477	60.904[b]	2.000	111.000	<0.001
	Hotelling's trace	1.097	60.904[b]	2.000	111.000	<0.001
	Roy's largest root	1.097	60.904[b]	2.000	111.000	<0.001

Note: "b" indicates that the F statistic is based on the exact statistic for the multivariate tests.

The analysis results indicate that the F values for Pillai's trace , Wilk's Lambda, Hotelling's trace , and Roy's Largest Root are all significant with a significance level of less than 0.05. This confirms that the implementation of digital storybooks based on Bali local culture is effective in simultaneously improving cultural citizenship literacy and student learning outcomes among fifth-grade students in Jembrana Regency. Specifically, there are notable differences in cultural citizenship literacy (Y1) and student learning outcomes (Y2) between students in the experimental group (A1) and the control group (A2) as shown in Table 15.

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Table 15. Tests of between-subjects effects.

Sources	Dependent variables	Type III sum of squares	Df	Mean square	F	Sig.
Corrected model	Cultural literacy (Y1)	898.302ᵃ	1	898.302	43.272	<.001
	Learning outcomes (Y2)	8253.168ᵇ	1	8253.168	80.547	<.001
Intercept	Cultural literacy (Y1)	941736.739	1	941736.739	45364.694	<.001
	Learning outcomes (Y2)	627328.391	1	627328.391	6122.400	<.001
Group	Cultural literacy (Y1)	898.302	1	898.302	43.272	<.001
	Learning outcomes (Y2)	8253.168	1	8253.168	80.547	<.001
Error	Cultural literacy (Y1)	2325.035	112	20.759	-	-
	Learning outcomes (Y2)	11476.019	112	102.464	-	-
Total	Cultural literacy (Y1)	944960.076	114	-	-	-
	Learning outcomes (Y2)	647057.579	114	-	-	-
Corrected total	Cultural literacy (Y1)	3223.337	113	-	-	-
	Learning outcomes (Y2)	19729.187	113	-	-	-

Note: "a" indicates values corresponding to the dependent variable *cultural literacy (Y1)*. "b" indicates values corresponding to the dependent variable *learning outcomes (Y2)*.

The tests between subjects effects reveal that the relationship between the teaching method (using digital storybooks based on Bali local culture or not) (A) and cultural citizenship literacy (Y1) results in an F value of 43.272 with a significance level of < 0.001. This indicates significant differences in cultural citizenship literacy (Y1) due to the different teaching methods (A). Similarly, the relationship between teaching methods (A) and student learning outcomes (Y2) yields an F value of 80.547 with a significance level of < 0.001. This demonstrates significant differences in student learning outcomes due to the teaching methods. Therefore, it can be concluded that using digital storybooks based on Bali local culture has a significant simultaneous effect on both cultural citizenship literacy (Y1) and student learning outcomes (Y2).

The simultaneous t-value is derived from the square root of the Wilks Lambda F value (F AY1) of 60.904; the two-tailed significance is < 0.05 indicating significant differences in cultural citizenship literacy (Y1) and student learning outcomes (Y2) between the experimental group (A1) and the control group (A2). The mean for Y1Y2A1 is 0.445 which is greater than Y1Y2A2 at 0.257. This demonstrates that learning with digital storybooks based on Bali local culture is more effective in simultaneously enhancing cultural citizenship literacy and student learning outcomes compared to traditional learning methods supported by an ES value of 0.851 which is categorized as high effectiveness.

Calculations to evaluate the effectiveness of using digital storybooks based on Bali local culture on cultural citizenship literacy and student learning outcomes of fifth-grade students in Jembrana Regency were conducted using t-tests as illustrated in Table 16.

Table 16. T-test results.

Variables	N	Mean	Standard deviation	T	Sig.	ES	Category
A1Y1	57	0.4175	0.4106	6.58	< 0.05	0.849	High effectiveness
A2Y1	57	0.0635	0.4169				
A1Y2	57	0.4725	0.3430	8.97	< 0.05	0.872	High effectiveness
A2Y2	57	0.4502	0.0256				
A1Y1Y2	57	0.445	0.377	7.80	< 0.05	0.851	High effectiveness
A2Y1Y2	57	0.257	0.221				

Note: A1 = Experimental group.
A2 = Control group.
Y1 = Cultural-citizenship literacy.
Y2 = Student learning outcomes.

According to Table 16 results: (1) The t-value for cultural citizenship literacy derived from the square root of the MANOVA F value (F AY1) of 43.272 shows a two-tailed significance of < 0.05. This signifies a notable difference in cultural citizenship literacy between the experimental group (A1) and the control group (A2) with mean Y1A1 at 0.4175 compared to Y1A2 at 0.0635. This suggests that learning through digital storybooks based on Bali local culture is more effective at enhancing cultural citizenship literacy than learning without these storybooks, supported by a high-effectiveness ES value of 0.987. (2) The t-value for student learning outcomes, calculated from the square root of the MANOVA F value (F AY2) of 80.547, shows a two-tailed significance of < 0.05. This indicates a significant difference in student learning outcomes between the experimental group (A1) and the control group (A2) with mean Y2A1 at 0.4725 versus Y2A2 at 0.4502. This demonstrates that digital storybooks based on Bali local culture are more effective for improving student learning outcomes than learning without these storybooks, as reflected by a high-effectiveness ES value of 0.872. (3) The simultaneous t-value, derived from the square root of the Wilks Lambda F value (F A) of 60.904 shows a two-tailed significance of < 0.05. This indicates significant differences in both cultural citizenship literacy (Y1) and student learning outcomes (Y2) between the experimental group (A1) and the control group (A2) with mean Y1Y2A1 at 0.445 compared to Y1Y2A2 at 0.257. Thus, digital storybooks based on Bali local culture are more effective in improving both cultural citizenship literacy and student learning outcomes simultaneously compared to learning without these storybooks, as demonstrated by a high-effectiveness ES value of 0.851.

4.6. Discussion

4.6.1. Effectiveness of Learning Using Bali Local Culture-Based Digital Story Books on Civic-Cultural Literacy of Grade V Elementary School Students in Jembrana Regency

The descriptive analysis of civic-cultural literacy shows that the experimental group achieved a mean score of 0.417, categorized as high while the control group had a mean score of 0.063 categorized as low. This

indicates a significant difference in the treatment effects between the two groups. The t-value for civic-cultural literacy derived from the MANOVA F-value of 143.272 is 6.578 with a two-tailed significance of less than 0.001. This confirms a significant difference in civic cultural literacy between the experimental group (A1) and the control group (A2) where the mean score of Y1A1 (0.417) is greater than Y1A2 (0.063). Thus, learning using Bali local culture-based digital storybooks is more effective in enhancing civic cultural literacy compared to a learning model without digital storybooks. This finding is supported by an effect size of 0.849 indicating high effectiveness.

One-way ANOVA testing further supported the impact of Bali local culture-based digital storybooks on civic cultural literacy with an increase in the mean score of the experimental group from 88.08 to 93.70 while the control group's mean score was 91.68. These findings align with previous research such as Budiarsa, Sudiana, and Arnyana (2022) who found that locally wise Bali storybooks significantly improved literacy skills among elementary school students. Similarly, Oktafianti, Dewi, and Hayat (2024) demonstrated that Nusantara folk stories effectively enhanced cultural and citizenship literacy among students.

Furthermore, Kurnia, Ummah, and Puspitasari (2023) found that picture books based on local culture positively impacted children's personal communication skills, social interactions, and responsibility. These studies collectively support the effectiveness of digital storybooks in promoting civic cultural literacy emphasizing the need for resource availability and support from schools, parents, and the community. Additionally, Murti and Handayani (2022) highlighted the effectiveness of digital media in improving cultural literacy and overall learning outcomes corroborating the findings of this study.

4.6.2. Effectiveness of Learning Using Bali Local Culture-Based Digital Story Books on Academic Achievement of Grade V Elementary School Students in Jembrana Regency

According to the descriptive analysis of students' academic performance, the experimental group (A1Y2) achieved an average score of 0.4725 which is classified as medium while the control group (A2Y2) had an average of 0.4502 also falling into the medium category. These results suggest a notable impact of the intervention on both groups as they are categorized similarly.

The t-value for students' academic achievement was derived from the square root of the MANOVA F value (F AY2) of 80.547 resulting in 8.975. The two-tailed significance value of < 0.001 indicates a significant difference in academic performance (Y2) between the experimental group (A1) and the control group (A2). The mean score for Y2A1 is 0.4725 compared to Y2A2 at 0.4502. This suggests that utilizing digital storybooks based on Bali local culture is more effective in enhancing students' academic performance than a learning approach that does not use these storybooks. This conclusion is further supported by an effect size of 0.872 which indicates a high level of effectiveness. Thus, the findings affirm that digital storybooks based on Bali local culture significantly improve the academic achievement of fifth-grade students in Jembrana Regency.

These results align with Ayuni, Suarjana, and Trisna (2023) who observed higher academic achievement among elementary school students treated with local wisdom-based digital comic media. The findings of Istiq'faroh and Mustadi (2020) also support the notion that digital media based on local wisdom can enhance contextual learning and academic performance. The same finding was observed by Dharmawan, Candiasa, and Astawan (2023) regarding the effectiveness of developing digital story books containing Tri Hita Karana. The Tri Hita Karana-themed storybooks produced were highly effective. This study found that the teaching materials were very effective with an average student score of 88 with 90% completeness. Therefore, the Tri Hita Karana-themed storybooks are declared effective in improving students' academic achievement.

4.6.3. Effectiveness of Learning Using Bali Local Culture-Based Digital Story Books Simultaneously on Cultural-Civic Literacy and Academic Achievement of Grade V Elementary School Students in Jembrana Regency

The simultaneous t-value was calculated as the square root of Wilks Lambda F value (60.904) resulting in 7.80. The two-tailed significance value of < 0.001 indicates a significant difference in both cultural civic literacy (Y1) and academic achievement (Y2) between the experimental group (A1) and the control group (A2). The mean for Y1Y2A1 is 0.445, which is greater than Y1Y2A2 at 0.257. This indicates that learning with Bali local culture-based digital storybooks is more effective in improving both cultural civic literacy and academic achievement simultaneously compared to learning without these digital storybooks. This finding is further supported by an effect size (ES) of 0.851, which falls into the high effectiveness category.

Tests of between-subjects effects revealed that the association between the learning model (A) and cultural civic literacy (Y1) produced an F value of 43.272 with a significance value of < 0.001 indicating a notable difference in cultural civic literacy due to the learning model. Similarly, the relationship between the learning model (A) and academic achievement (Y2) yielded an F value of 80.547 with a significance value of < 0.001 indicating a significant difference in academic achievement attributable to the use of Bali local culture-based digital storybooks.

The t-test results revealed that for cultural civic literacy the two-tailed significance value was < 0.001 indicating a significant difference between the experimental group (A1) and the control group (A2). With a mean of 0.4175 for Y1A1 compared to 0.0635 for Y1A2, digital storybooks based on Bali local culture were shown to be more effective supported by a high effect size (ES) of 0.849. Similarly, for academic achievement, the significance value was < 0.001, with a mean of 0.4725 for Y2A1 versus 0.4502 for Y2A2 demonstrating greater effectiveness in the experimental group, and an ES of 0.872 confirms high effectiveness. Additionally, for simultaneous improvements in both cultural civic literacy and academic achievement, the significance value was < 0.001, with a mean of 0.445 for Y1Y2A1 compared to 0.257 for Y1Y2A2, underscoring the superior effectiveness of the digital storybooks supported by an ES of 0.851.

The tests between-subjects effects showed a significant relationship between the learning model (A) and both cultural civic literacy (Y1) and academic achievement (Y2) with F values of 43.272 and 80.547, respectively, and significance < 0.001. These findings are consistent with Aisyah et al. (2023) who found a positive correlation

between learning interest and academic achievement through digital comic learning media. Additionally, Putri and Nurhasanah (2023) demonstrated that cultural and civic literacy programs enhanced students' global citizenship skills.

5. Conclusion

The study found that the implementation of Bali local culture-based digital storybooks significantly enhances the cultural civic literacy and academic achievement of grade V elementary school students in Jembrana Regency. The effectiveness of this implementation on cultural civic literacy is high with an effect size (ES) of 0.849. Similarly, the impact on academic achievement is also high with an ES of 0.872. Additionally, the simultaneous use of these digital storybooks for both cultural civic literacy and academic achievement yielded a high effectiveness, with an ES of 0.851. These findings demonstrate that incorporating Bali local culture-based digital storybooks in the curriculum positively influences both cultural civic literacy and academic achievement among elementary school students in Jembrana Regency.

6. Suggestions and Implications

The study offers several suggestions for enhancing educational practices and policies. First, it is recommended that schools integrate Bali local culture-based digital storybooks into their official curriculum. This integration can help improve both cultural civic literacy and academic achievement among students. Additionally, teachers should receive training on effectively using these digital storybooks in their teaching practices, including methods for incorporating cultural content into various subjects. The success observed in Jembrana Regency suggests that broader implementation could be beneficial. Extending this approach to other regions of Bali and potentially other parts of Indonesia could further validate its effectiveness in diverse educational settings. Moreover, encouraging parental involvement by engaging with these digital storybooks at home can reinforce the cultural and academic benefits. Schools could provide workshops or materials to support parents in this endeavor. Regular assessments and feedback mechanisms should be established to continuously evaluate the digital storybooks' effectiveness, allowing for necessary adjustments and improvements.

The implications of this study are significant. The use of local culture-based educational tools helps preserve and promote regional cultures among young students enriching their learning experiences and fostering a deeper understanding and appreciation of local heritage. The high effectiveness of these digital storybooks indicates that culturally relevant materials can significantly boost academic performance, supporting the notion that integrating cultural context into learning materials is a powerful educational tool. These findings can inform educational policymakers to advocate for the inclusion of culturally based educational resources in national and regional education policies leading to a more inclusive and contextually relevant education system. Furthermore, the positive outcomes of this study open avenues for further research into other culturally based educational interventions, exploring different cultural contexts and their impacts on various aspects of student development. Finally, the success of this initiative highlights the need for developing more digital resources that incorporate local culture. Educational publishers and content creators can collaborate with cultural experts to produce a wide range of culturally relevant educational materials.

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