
The Influence Of Digital Learning Media Assisted By Google Arts And Culture On Students' Sbdp Learning Outcomes Class V SD Inpres 2 Tanamoindi

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ABSTRACT

This study was motivated by the limited use of digital learning media in Arts, Culture, and Crafts (SBdP) learning at the elementary school level. Learning activities that are still dominated by conventional methods often result in low student engagement, reduced learning motivation, and less optimal learning outcomes. Meanwhile, the rapid development of digital technology provides opportunities to create more engaging, interactive, and contextual learning experiences. However, studies examining Google Arts and Culture as a digital learning medium in elementary school SBdP learning remain limited. Therefore, this study aimed to determine the effect of Google Arts and Culture-assisted digital learning media on the learning outcomes of fifth-grade students at SD Inpres 2 Tanamodindi. This research employed a quantitative approach using a pre-experimental method with a One-Group Pretest–Posttest Design. The participants consisted of 28 students from class VA. Data were collected through multiple-choice learning outcome tests administered before and after the treatment. The data were analyzed using descriptive statistics, normality testing, paired-sample t-test, and the Normalized Gain (N-Gain) test. The findings showed that the mean score increased from 56.4 in the pretest to 82.1 in the posttest, with an N-Gain score of 0.59 categorized as moderate and a significance value of 0.001 (<0.05). These findings indicate that Google Arts and Culture-assisted digital learning media can support the improvement of elementary students' SBdP learning outcomes.

Keywords: Digital Learning Media, Google Arts and Culture, Learning Outcomes, SBdP, Elementary School

ABSTRACT

Penelitian ini dilatarbelakangi oleh belum optimalnya pemanfaatan media pembelajaran digital dalam pembelajaran Seni Budaya dan Prakarya (SBdP) di sekolah dasar. Pembelajaran yang masih didominasi metode konvensional menyebabkan siswa kurang aktif, kurang termotivasi, dan berdampak pada hasil belajar yang belum maksimal. Di sisi lain, perkembangan teknologi digital memberikan peluang untuk menciptakan pembelajaran yang lebih menarik, interaktif, dan kontekstual. Namun, penelitian yang mengkaji penggunaan Google Arts and Culture sebagai media pembelajaran digital pada mata pelajaran SBdP di sekolah dasar masih terbatas. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh penggunaan media pembelajaran digital berbantuan Google Arts and Culture terhadap hasil belajar SBdP siswa kelas V SD Inpres 2 Tanamodindi. Penelitian ini menggunakan pendekatan kuantitatif dengan metode pre-eksperimental dan desain One Group Pretest-Posttest Design. Subjek penelitian berjumlah 28 siswa kelas VA. Data dikumpulkan melalui tes hasil belajar berupa soal pilihan ganda yang diberikan sebelum dan sesudah perlakuan. Data dianalisis menggunakan statistik deskriptif, uji normalitas, uji paired sample t-test, dan uji N-Gain. Hasil penelitian menunjukkan bahwa nilai rata-rata siswa meningkat dari 56,4 menjadi 82,1 dengan nilai N-Gain sebesar 0,59 kategori sedang dan nilai signifikansi 0,001 ($<0,05$). Temuan ini menunjukkan bahwa penggunaan media pembelajaran digital berbantuan Google Arts and Culture dapat mendukung peningkatan hasil belajar SBdP siswa sekolah dasar.

Kata kunci: Media Pembelajaran Digital, Google Arts and Culture, hasil belajar, SBdP, sekolah dasar.

INTRODUCTION

Learning outcomes are one of the primary indicators used to measure the success of the educational process. Learning outcomes reflect students' mastery of knowledge, attitudes, and skills obtained through learning experiences and are used to evaluate the achievement of instructional objectives (SL, 2021). According to Sudjana in (Hidayatullah, 2021) learning outcomes encompass cognitive, affective, and psychomotor aspects that develop as a result of learning activities. Therefore, learning outcomes are not merely reflected in students' scores but also indicate changes in understanding, behavior, and competencies achieved throughout the learning process (Karundeng, 2023).

The improvement of learning outcomes has become an important concern in elementary education because learning outcomes serve as evidence of the effectiveness of instructional strategies implemented by teachers (Yogi Fernando et al., 2024). Students who achieve optimal learning outcomes tend to demonstrate better conceptual understanding, higher learning motivation, and stronger problem-solving skills (Irawati et al., 2021). Conversely, low learning outcomes indicate that students experience difficulties in understanding learning materials and achieving expected competencies. In the context of Arts, Culture, and Crafts (SBdP), low learning outcomes are particularly concerning because this subject is designed not only to develop artistic knowledge but also to foster creativity, critical thinking, cultural appreciation, imagination, and self-expression (Asari et al., 2021). Consequently, low learning outcomes in SBdP may hinder the development of these essential competencies required in twenty-first-century learning (Pembayun, 2023).

Previous studies have shown that students' learning outcomes are influenced by various internal and external factors, including learning motivation, learning independence, teaching strategies, classroom environment, and learning media. Research conducted by (Sitepu, 2021)

revealed that low learning outcomes are often associated with limited student engagement and insufficient learning motivation. Similarly, (Wardani et al., 2024) found that monotonous learning methods contribute to students' lack of interest and reduced participation in classroom activities. In addition, (P, 2023) emphasized that teachers play a significant role in improving learning outcomes through effective classroom management and appropriate instructional strategies. Therefore, creating a learning environment that actively engages students is essential for improving academic achievement.

One of the factors that significantly contributes to learning effectiveness is the use of appropriate learning media. Learning media function as instructional tools that facilitate communication between teachers and students and help present learning materials in a more meaningful manner. The rapid advancement of information and communication technology has encouraged the integration of digital learning media into educational practices. Digital learning media provide opportunities for teachers to present information through visual, audio, animation, and interactive features that can enhance students' learning experiences. (Hermansah, 2025) stated that digital learning media can create interactive learning environments and increase students' enthusiasm for learning by presenting information in a more engaging format. Likewise, (Syarif, 2025) argued that digital media enable teachers to present abstract concepts in concrete forms, thereby facilitating students' understanding of learning materials.

The effectiveness of digital learning media can be explained through Mayer's Multimedia Learning Theory. According to this theory, students learn more effectively when information is presented through a combination of visual and verbal representations rather than through text alone. Visual elements help learners process information more efficiently by reducing cognitive load and promoting meaningful learning. Therefore, digital learning media that integrate images, videos, animations, and interactive content have the potential to improve students' comprehension and learning outcomes.

In addition to Multimedia Learning Theory, Constructivist Learning Theory also provides a theoretical foundation for the use of digital learning media. Constructivism suggests that learners actively construct knowledge through interaction with learning resources and experiences rather than passively receiving information from teachers (Pesik et al., 2024). Learning occurs when students engage in exploration, observation, reflection, and interpretation of information. Consequently, learning environments that encourage active participation and independent exploration are more likely to support meaningful learning and knowledge construction.

The implementation of student-centered learning is closely related to constructivist principles. Student-centered learning emphasizes students' active involvement in the learning process, allowing them to explore information, solve problems, and construct understanding independently. Previous research has demonstrated that student-centered learning environments contribute to higher engagement, improved conceptual understanding, and better learning outcomes compared to teacher-centered approaches. Therefore, integrating

digital learning media into student-centered learning activities can provide meaningful opportunities for students to explore learning materials actively.

In the context of SBdP learning, the integration of digital learning media is particularly important because many learning materials involve visual appreciation, artistic exploration, and cultural understanding. SBdP is a subject that aims to develop students' creativity, aesthetic sensitivity, artistic skills, and appreciation of cultural diversity. Through SBdP learning, students are expected to recognize cultural heritage, appreciate artistic works, and express ideas creatively. Since many concepts in SBdP are visual in nature, the use of digital learning media can provide richer learning experiences compared to conventional teaching methods.

One digital platform that has considerable potential for supporting SBdP learning is Google Arts and Culture. Google Arts and Culture is a digital platform that provides access to artworks, cultural artifacts, museums, historical sites, and virtual exhibitions from various parts of the world. Through this platform, students can explore artistic and cultural resources interactively without geographical limitations. The platform offers high-resolution images, virtual museum tours, multimedia content, and interactive exploration features that can support learning activities.

From a theoretical perspective, Google Arts and Culture aligns with both Multimedia Learning Theory and Constructivist Learning Theory. The platform presents learning materials through visual and textual information simultaneously, which facilitates cognitive processing and comprehension (Rezeki et al., 2021). Furthermore, students can independently explore artworks and cultural objects, enabling active knowledge construction through observation and inquiry. Through visual exploration, students can directly observe artistic details, compare cultural artifacts, and connect learning materials with real-world contexts (Kamal et al., 2025). This process is expected to improve conceptual understanding, increase learning motivation, and ultimately enhance learning outcomes.

Several previous studies have reported positive effects of digital learning media on students' engagement and academic achievement. Research has shown that virtual museum learning environments provide authentic learning experiences that support knowledge acquisition and cultural understanding (Hasanah et al., 2024). Other studies have found that digital art education promotes creativity, critical thinking, and active participation in learning activities. Additionally, interactive digital platforms have been shown to increase students' motivation and interest in learning through immersive and visually rich experiences (Adawiyah et al., 2025). These findings indicate that digital learning environments have considerable potential to improve educational outcomes.

However, despite the growing body of research on digital learning media, several gaps remain. First, many previous studies have focused on general digital learning environments rather than specifically examining Google Arts and Culture as a learning medium. Second, research related to Google Arts and Culture has predominantly been conducted in higher education, museum education, and informal learning contexts to (Cowin, J. B., & Ed, 2020). Third, empirical studies investigating its effectiveness in elementary school SBdP learning,

particularly in Indonesia, remain limited. Furthermore, previous studies have generally emphasized learning motivation, engagement, and user experience, while evidence regarding its direct influence on elementary students' learning outcomes is still insufficient.

The existence of these gaps indicates the need for further research examining the effect of Google Arts and Culture on students' learning outcomes in elementary school settings. Such research is important because elementary students require learning experiences that are interactive, contextual, and visually engaging to support their cognitive development and understanding of artistic concepts which (Debattista, M. G., & Portelli, 2018).

Based on observations and interviews conducted in August 2025 at SD Inpres 2 Tanamodindi, it was found that the learning outcomes of fifth-grade students in SBdP were relatively low. This condition was associated with the limited use of innovative learning media and the dominance of conventional teaching methods during classroom instruction. Teachers rarely utilized digital learning media, resulting in learning activities that were less interactive and less engaging for students. Consequently, students demonstrated low motivation and encountered difficulties in understanding learning materials effectively.

Considering these problems, the use of digital learning media assisted by Google Arts and Culture is expected to provide an innovative solution for improving students' learning outcomes. Through interactive visual exploration, virtual exhibitions, and access to authentic artistic and cultural resources, students are expected to become more actively involved in learning activities and develop a deeper understanding of SBdP materials.

Therefore, this study aims to determine the effect of digital learning media assisted by Google Arts and Culture on the learning outcomes of fifth-grade students in Arts, Culture, and Crafts (SBdP) subjects at SD Inpres 2 Tanamodindi

METHODS

Type and Design

A research design serves as a framework that guides researchers in conducting a study systematically and in accordance with the research objectives. This study employed a quantitative approach using a pre-experimental method with a One-Group Pretest-Posttest Design. According to Sugiyono (2019), a pre-experimental design is used to examine the effect of a treatment on a single group without involving a control group.

The selection of this design was based on practical considerations in the research setting. The study was conducted in a school that only provided one available class for the research, making it difficult to establish an equivalent control group as required in a quasi-experimental design. In addition, school regulations and instructional schedules did not allow the researcher to divide students into experimental and control groups. Therefore, the One-Group Pretest-Posttest Design was considered the most appropriate design to investigate the effect of Google Arts and Culture on students' creative thinking skills in SBdP learning.

The research procedure consisted of three stages: pretest, treatment, and posttest. The pretest was administered to measure students' initial creative thinking skills before the implementation of the learning media. The treatment was conducted over four meetings, with

each meeting lasting approximately 70 minutes. The learning materials focused on visual arts topics in SBdP, including the introduction of artworks, elements of art, appreciation of paintings, and creating simple artwork inspired by digital collections.

During the treatment, Google Arts and Culture was utilized as the primary learning media. Students explored virtual museum collections, observed various artworks from different cultures, analyzed visual elements, discussed artistic characteristics, and developed creative ideas based on the artworks they observed. Learning activities included observation, discussion, exploration, idea generation, and artwork creation. After completing the treatment sessions, a posttest was administered to determine changes in students' creative thinking skills after using Google Arts and Culture in SBdP learning. The difference between the pretest and posttest scores was used to evaluate the effectiveness of the treatment.

Data and Data Sources

In this study, the treatment applied was the use of digital learning media assisted by Google Arts and Culture to improve the learning outcomes of fifth-grade students in Arts, Culture, and Crafts (SBdP) at SD Inpres 2 Tanamodindi. This study employed a pre-experimental method using a One-Group Pretest-Posttest Design. This design was selected because it allows researchers to measure changes in students' learning outcomes before and after the implementation of the treatment. Although this design does not involve a control group and has limitations in terms of internal validity, it was considered appropriate for this study due to practical constraints in the school setting, such as limited class availability and school policies that did not permit the division of students into experimental and control groups. Therefore, the design was used to obtain preliminary empirical evidence regarding the effectiveness of digital learning media assisted by Google Arts and Culture in improving students' learning outcomes.

Table 1. One Group Pretest-Posttest Design

<i>Pretest</i>	<i>Treatment</i>	<i>Posttest</i>
O1	X	O2

Information :

X : Treatment using digital learning media based on Google Arts and Culture

O1: Pretest results before treatment

O2: Posttest results after treatment

Based on the research design, the effectiveness of the treatment was determined by comparing students' pretest (O_1) and posttest (O_2) scores. The difference between these scores was used to identify the extent to which the use of Google Arts and Culture-assisted digital learning media influenced students' learning outcomes.

This research was conducted at SD Inpres 2 Tanamodindi, located on Jl. Balai Kota Timur No. 1, Palu City, Central Sulawesi Province. According to (Suriani, 2023), a population refers to the entire group of individuals or objects possessing specific characteristics relevant to a study. The population in this study consisted of all fifth-grade students at SD Inpres 2 Tanamodindi, totaling 56 students distributed across two classes.

According to (Mushofa, M., Hermina, D., 2024) a sample is a subset of the population selected to represent the characteristics of the entire population. The sample in this study consisted of 28 students from class VA. The sample was selected using purposive sampling, which is a sampling technique based on specific considerations and criteria established by the researcher (Sugiyono., 2019) Class VA was chosen because it met several criteria relevant to the objectives of the study. First, students in class VA had relatively homogeneous academic abilities based on previous semester achievement records. Second, recommendations from the classroom teacher indicated that the class demonstrated learning characteristics representative of the overall fifth-grade population. Third, the classroom had adequate facilities to support the implementation of digital learning media, including internet access and the availability of digital devices required during the learning process (Sulung, 2024). Fourth, preliminary observations revealed that students in class VA experienced difficulties in understanding SBdP learning materials and showed relatively low learning outcomes, making the class suitable for implementing the proposed learning intervention.

The data used in this study were quantitative data obtained through written tests in the form of multiple-choice questions designed to measure students' learning outcomes. The study utilized both primary and secondary data sources. According to (Haifa et al., 2025) primary data are data collected directly by researchers through observation, interviews, and tests. In this study, primary data were obtained from students' pretest and posttest scores. The tests were administered to all 28 students participating in the study.

Secondary data were obtained from books, scientific journals, school documents, and relevant previous studies related to digital learning media, Google Arts and Culture, and student learning outcomes. According to Sulung (2024), secondary data refer to information obtained indirectly from primary sources through existing documents and research reports.

The operational definitions of the variables in this study are as follows:

1. The independent variable (X) is the use of digital learning media assisted by Google Arts and Culture. This variable refers to the implementation of digital learning activities utilizing visual exploration features, virtual exhibitions, and cultural resources available through the Google Arts and Culture platform.
2. The dependent variable (Y) is students' learning outcomes in the SBdP subject. Learning outcomes are defined as students' cognitive achievement measured through scores obtained from multiple-choice tests administered before and after the treatment.

The data obtained in this study were measured using a ratio scale. According to Asmita and Fitriani (2022) a ratio scale possesses equal intervals and an absolute zero point, allowing meaningful comparison between values. In this study, the ratio scale was applied to students' learning outcome scores ranging from 0 to 100, obtained from the multiple-choice tests administered during the pretest and posttest. Based on the research design model explained previously, researchers can identify the extent to which the use of digital learning media assisted by Google Arts and Culture has an impact on improving student learning outcomes by comparing pretest (O1) and posttest (O2) scores.

Data collection technique

Data collection techniques used in this study included learning outcome tests, interviews, and documentation. The learning outcome test was used as the primary instrument to measure students' cognitive achievement in the Arts, Culture, and Crafts (SBdP) subject. Meanwhile, interviews and documentation were used as supporting techniques to obtain additional information regarding the learning process and to strengthen the interpretation of the quantitative findings.

Research instruments are tools used by researchers to collect data systematically and accurately in accordance with the objectives of the study (Sugiyono, 2019). In this study, the primary instrument was a learning outcome test in the form of multiple-choice questions. According to (Zayrin et al., 2025) data collection instruments are tools that assist researchers in obtaining data in a structured and measurable manner. The test instrument was designed to measure students' cognitive learning outcomes in SBdP after participating in learning activities using digital learning media assisted by Google Arts and Culture.

The test items were developed based on the learning objectives and competency indicators of the SBdP subject for fifth-grade elementary school students. The indicators measured in the test included: (1) identifying various forms of visual artworks, (2) recognizing elements and principles of art, (3) understanding cultural diversity through artistic works, (4) analyzing characteristics of artworks, and (5) appreciating artistic and cultural products. These indicators were used as the basis for constructing the test blueprint (table of specifications) to ensure that all test items represented the competencies to be achieved (Setiadi, 2021).

Before being administered in the main study, the instrument underwent expert validation and empirical testing. Content validation was conducted by two experts consisting of a lecturer in elementary education and an experienced fifth-grade teacher in the SBdP subject area. The validators evaluated the instrument based on content relevance, clarity of language, suitability with learning objectives, and appropriateness of the cognitive level of the questions. Suggestions provided by the validators were used to revise and improve the quality of the instrument before the field trial was conducted.

After the validation process, the instrument was tested on students from a different elementary school with characteristics similar to those of the research participants. The trial involved 30 multiple-choice questions. The validity test was conducted using IBM SPSS Statistics 25 through item correlation analysis. The criteria used for determining item validity were as follows:

- * If the calculated correlation coefficient ($r\text{-count}$) $>$ $r\text{-table}$ at a significance level of 0.05, the item was considered valid.
- * If the calculated correlation coefficient ($r\text{-count}$) $<$ $r\text{-table}$ at a significance level of 0.05, the item was considered invalid.

Based on the validity test results, 18 out of the 30 items were declared valid and met the requirements for measuring students' learning outcomes. The remaining 12 items were excluded because they did not meet the minimum validity criteria. Therefore, only the 18 valid items were used as the research instrument for both the pretest and posttest.

Following the validity test, a reliability test was conducted to determine the consistency of the instrument. Reliability refers to the extent to which an instrument produces stable and consistent results when used repeatedly. In this study, reliability testing was performed using the Cronbach's Alpha method through IBM SPSS Statistics 25. According to (Saputra, 2025), an instrument is considered reliable if the Cronbach's Alpha coefficient exceeds 0.60. The reliability criteria used in this study were as follows:

- * If Cronbach's Alpha > 0.60 , the instrument is considered reliable.
- * If Cronbach's Alpha < 0.60 , the instrument is considered unreliable.

The results of the reliability test showed a Cronbach's Alpha value of 0.849 for the 30 test items. Since the obtained value was higher than 0.60, the instrument was categorized as highly reliable. Therefore, the test instrument was considered suitable for use in the research.

In addition to the learning outcome test, interviews were conducted to obtain supporting information regarding the implementation of learning activities using Google Arts and Culture. The interviews employed a semi-structured format, allowing researchers to explore information more deeply while maintaining consistency with the research objectives. The interview participants consisted of the fifth-grade classroom teacher and several students selected purposively. The interviews aimed to identify students' responses, learning experiences, and perceptions regarding the use of digital learning media assisted by Google Arts and Culture during the learning process.

Documentation was also used as a supporting data collection technique. The documentation collected included photographs of learning activities, lesson plans, students' attendance records, students' learning outcome scores, school profiles, and other relevant documents related to the implementation of the study. The data obtained in this study were analyzed using descriptive and inferential statistical techniques with the assistance of IBM SPSS Statistics 25 software.

1. Descriptive Statistical Analysis

Descriptive statistical analysis is a statistical method used to describe and summarize research data without making broader generalizations (Marhamah, 2016). In this study, descriptive statistics were employed to present students' learning outcomes before and after the treatment. The descriptive analysis included the mean score, minimum score, maximum score, and standard deviation of both the pretest and posttest results. These statistics were used to provide an overview of students' learning achievement and the changes that occurred after the implementation of digital learning media assisted by Google Arts and Culture.

2. Normality Test

According to Isnaini, (2025) a normality test is a statistical procedure used to determine whether a dataset follows a normal distribution. The normality test is important because it serves as a prerequisite for conducting parametric statistical analyses, including the paired-sample t-test. In this study, the normality test was conducted using the Shapiro-Wilk test through IBM SPSS Statistics 25. The data obtained in this study were analyzed

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The criteria for determining data normality were as follows:

* If the significance value (Sig.) > 0.05, the data are normally distributed.

* If the significance value (Sig.) < 0.05, the data are not normally distributed.

If the pretest and posttest data were found to be normally distributed, further analysis was conducted using parametric statistical tests.

3. Normalized Gain (N-Gain) Test

The Normalized Gain (N-Gain) test was used to determine the extent to which the learning intervention improved students' learning outcomes. N-Gain measures the relative improvement between pretest and posttest scores and is commonly used to evaluate the effectiveness of educational interventions. Amelia et al., (2025)

The N-Gain score was calculated using the following formula:

$$N - Gain = \frac{Skor\ Posttest - Skor\ Pretest}{Skor\ Ideal - Skor\ Pretest}$$

The N-Gain values were interpreted according to the following criteria:

Table 2. N-Gain Score Criteria

N-Gain Value	Interpretation
$G > 0.7$	Tall
$0.3 \leq g \leq 0.7$	Currently
$0 < g < 0.30$	Low

In addition, learning effectiveness was evaluated using the N-Gain percentage criteria as shown below:

Table 3. N-Gain Percentage Criteria

Percentage (100%)	Interpretation
<40	Ineffective
40-55	Less Effective
56-75	Quite Effective
>76	Effective

4. Hypothesis Testing

After confirming that the pretest and posttest data were normally distributed, hypothesis testing was conducted using the paired-sample t-test. The paired-sample t-test was used to determine whether there was a statistically significant difference between students' learning outcomes before and after the implementation of digital learning media assisted by Google Arts and Culture.

The hypotheses tested in this study were formulated as follows:

Ha: There is a significant effect of digital learning media assisted by Google Arts and Culture on the SBdP learning outcomes of fifth-grade students at SD Inpres 2 Tanamodindi.

H₀: There is no significant effect of digital learning media assisted by Google Arts and Culture on the SBdP learning outcomes of fifth-grade students at SD Inpres 2 Tanamodindi.

The paired-sample t-test was conducted using IBM SPSS Statistics 25 with a significance level of 0.05. The decision-making criteria were as follows:

* If the significance value Sig. (2-tailed) < 0.05, Ha is accepted and H₀ is rejected. This indicates that there is a significant effect of digital learning media assisted by Google Arts and Culture on students' learning outcomes.

* If the significance value Sig. (2-tailed) > 0.05, Ha is rejected and H₀ is accepted. This indicates that there is no significant effect of digital learning media assisted by Google Arts and Culture on students' learning outcomes.

The results of the paired-sample t-test were used to determine whether the improvement in students' posttest scores was statistically significant after receiving the learning intervention.

RESULTS AND DISCUSSION

Results

Descriptive statistical analysis was conducted using IBM SPSS Statistics 25. The analysis included the mean score, standard deviation, minimum score, and maximum score for both pretest and posttest data. The pretest was administered on January 9, 2026, to 28 students of Class VA at SD Inpres 2 Tanamodindi. The results of the descriptive analysis are presented in Table 4.

Table 4. Results of Pretest Data Analysis

Statistics	Pretest Data
Mean	38.81
Standard Deviation	14,621
Minimum Score	11
Maximum Score	67

Based on the pretest data analysis, the mean score obtained by students was 38.81. The standard deviation was 14.621, indicating variation in students' initial learning outcomes. The minimum score obtained was 11, while the maximum score was 67.

2. Posttest learning outcomes

The posttest was conducted on January 14, 2026. One student was absent during the posttest administration; therefore, only 27 complete paired datasets were included in the subsequent analyses (normality test, paired sample t-test, and N-Gain analysis). The descriptive results of the posttest are presented in Table 5.

Table 5 Posttest Data Analysis Results

Statistics	Pretest Data
Mean	78.11
Standard Deviation	11,550
Minimum Score	56
Maximum Score	100

The posttest results showed an increase in students' scores compared to the pretest results. The mean posttest score was 78.11 with a standard deviation of 11.550. The minimum score obtained was 56, while the maximum score reached 100.

3. Normality Test Results

The normality test was conducted using the Shapiro-Wilk test through IBM SPSS Statistics 25 to determine whether the data were normally distributed. The results are presented in Table 6.

Table 6. Normality Test Results

Statistics	Pretest Data		
	Statistics	Df	Sig
<i>Experiment Pre-test</i>	.976	27	.751
<i>Post-test Experiment</i>	.959	27	.202

The Shapiro-Wilk test showed a significance value of 0.751 for the pretest data and 0.202 for the posttest data. Since both significance values were greater than 0.05, the pretest and posttest data were considered normally distributed. Therefore, the assumptions required for conducting the Paired Sample t-Test were fulfilled.

4. Paired Sample t-Test Results

Since the data met the normality assumption, hypothesis testing was conducted using the Paired Sample t-Test. The results are presented in Table 7.

Table 7. Results of the Paired Sample T-Test Hypothesis Test

Paired Differences						Significances	
Mean		95% Confidence		t	Df		
Std. Deviation	Std. Mean Error	Interval of the Difference	Lower	Upper	One-Sided p	Two-Sided p	
Pair 1 Pretest - Posttest t	-39,296	13,094	2,520	-44,476	34.117	.994	
						27	<001
							<001

The paired sample t-test analysis showed a mean difference of -39.296 between pretest and posttest scores. The calculated t-value was -15.594 with 27 degrees of freedom. The significance value ($p < 0.001$) was lower than 0.05, indicating a statistically significant difference between students' pretest and posttest scores.

5. N-Gain Test Results

The N-Gain test was conducted to determine the level of improvement in students' learning outcomes after the implementation of the treatment. The analysis was based on 27 students who completed both the pretest and posttest.

Table 8. N-Gain Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
N-Gain Score	27	.15	1.00	.6417	.18444

The N-Gain analysis showed a minimum score of 0.15 and a maximum score of 1.00. The mean N-Gain score was 0.6417 with a standard deviation of 0.18444. Based on the N-Gain classification criteria ($0.3 \leq g < 0.7$), the average N-Gain score falls within the moderate category, indicating a moderate improvement in students' learning outcomes following the treatment.

Discussion

The findings of this study indicate that the use of digital learning media assisted by Google Arts and Culture positively influenced the learning outcomes of fifth-grade students in the Arts, Culture, and Crafts (SBdP) subject at SD Inpres 2 Tanamodindi. This is evidenced by the increase in students' average scores from the pretest to the posttest, the N-Gain score of 0.64 which falls within the moderate category, and the results of the paired-sample t-test showing a significance value of 0.001 (< 0.05). These findings suggest that the integration of Google Arts and Culture into the learning process contributed significantly to improving students' understanding of decorative motifs from various regions of Indonesia.

The improvement in students' learning outcomes can be explained through the characteristics of Google Arts and Culture as a digital learning medium. Unlike conventional learning methods that primarily rely on verbal explanations and textbook materials, Google Arts and Culture provides rich visual representations, high-resolution images, virtual exhibitions, and interactive exploration features. These features allow students to observe decorative motifs directly and examine their characteristics in greater detail. As a result, students are able to construct a more concrete understanding of learning materials that might otherwise remain abstract when presented solely through verbal explanations.

From a theoretical perspective, these findings support Mayer's Multimedia Learning Theory, which states that learning becomes more effective when information is presented through both visual and verbal channels simultaneously. Visual representations help students process information more efficiently because they reduce cognitive load and facilitate the organization of new knowledge into existing cognitive structures. In this study, students did not merely listen to explanations about decorative motifs but were also able to observe authentic visual examples from different regions. This combination of visual and verbal information enabled students to understand concepts more deeply, which subsequently improved their learning outcomes.

Furthermore, the results are consistent with Constructivist Learning Theory, which emphasizes that knowledge is actively constructed by learners through interaction with learning resources and experiences. Through Google Arts and Culture, students were given opportunities to explore cultural artifacts, observe artistic details, compare decorative motifs, and discuss their findings with peers. These learning activities encouraged students to become active participants in the learning process rather than passive recipients of information. Consequently, students developed a deeper understanding of the material because knowledge was acquired through exploration and discovery rather than memorization.

The positive impact of Google Arts and Culture was further strengthened by the implementation of the Discovery Learning model. Through the stages of stimulation, problem identification, data collection, data processing, verification, and conclusion drawing, students actively engaged in investigating learning materials. During classroom activities, students collaborated with their peers, discussed observations, and analyzed information obtained from digital resources. Such activities promoted critical thinking, curiosity, and active participation, which are important factors contributing to improved learning outcomes. Therefore, the improvement observed in this study was not solely the result of digital media use but also the result of student-centered learning activities facilitated through Discovery Learning.

Although the N-Gain score indicated a moderate improvement, this finding remains meaningful and warrants further discussion. The moderate category suggests that the intervention successfully improved students' learning outcomes but did not yet achieve the highest level of effectiveness. Several factors may explain this result. First, students were introduced to Google Arts and Culture for the first time, requiring an adaptation period before they could fully utilize the platform's features. Second, the duration of the intervention was relatively short, limiting students' opportunities to develop deeper familiarity with the

learning media. Third, differences in students' digital literacy levels may have influenced their ability to navigate and utilize the platform effectively Mayer., (2024). Fourth, individual differences in prior knowledge and learning readiness could have affected the extent to which students benefited from the learning intervention.

Despite these limitations, the moderate N-Gain score demonstrates that Google Arts and Culture has considerable potential as an educational tool in elementary school settings. The findings suggest that continuous and long-term integration of digital learning media may produce greater improvements in learning outcomes. Future studies involving longer intervention periods and more extensive learning activities may yield higher levels of effectiveness.

The results of this study are consistent with previous research indicating that digital learning media can enhance student engagement, motivation, and academic achievement. Studies conducted by Yadi (2025) Arifin (2024) and Sa'idah (2021) similarly reported that digital learning environments support students' active participation and improve learning outcomes. However, the present study extends previous findings by demonstrating the effectiveness of Google Arts and Culture specifically in elementary school SBdP learning. This finding contributes to the growing body of evidence supporting the use of digital cultural resources as educational tools in primary education.

The findings also have important implications for elementary school learning practices. First, teachers should consider integrating digital learning media into SBdP instruction to provide students with richer and more authentic learning experiences Carozzino et al., (2010). Second, the use of Google Arts and Culture can help students connect classroom learning with real-world cultural artifacts and artistic works, thereby making learning more meaningful and contextual. Third, the integration of digital media can support the development of twenty-first-century skills, including critical thinking, creativity, communication, collaboration, and digital literacy. Finally, schools should provide adequate technological infrastructure and professional development opportunities to enable teachers to effectively utilize digital learning resources in classroom instruction Styliani (2009).

Overall, the findings suggest that digital learning media assisted by Google Arts and Culture can serve as an effective alternative for enhancing SBdP learning outcomes in elementary schools. Through visual exploration, active learning experiences, and student-centered instructional approaches, the platform facilitates meaningful learning that supports students' cognitive development and cultural understanding.

CONCLUSION

Based on the findings of this study, it can be concluded that the use of digital learning media assisted by Google Arts and Culture was associated with improved learning outcomes among fifth-grade students in the Arts, Culture, and Crafts (SBdP) subject at SD Inpres 2 Tanamodindi. This finding is supported by the increase in students' posttest scores compared to their pretest scores, the moderate N-Gain score, and the results of the paired-sample t-test,

which indicated a statistically significant difference between students' learning outcomes before and after the implementation of the learning intervention. The improvement in learning outcomes suggests that Google Arts and Culture can provide meaningful learning experiences through visual exploration, access to authentic artworks, and interactive learning activities that support students' understanding of artistic and cultural concepts. The integration of digital learning media into classroom instruction encourages students to engage more actively in the learning process and facilitates a deeper understanding of SBdP materials.

This study contributes to the growing body of knowledge on the use of digital learning media in elementary education, particularly in SBdP learning. It provides empirical evidence that Google Arts and Culture can serve as a valuable educational resource for supporting student learning and enhancing engagement with artistic and cultural content.

The findings also have practical implications for teachers and schools. Teachers are encouraged to integrate digital learning media into SBdP instruction to create more interactive, contextual, and student-centered learning environments. Schools should support the implementation of technology-enhanced learning by providing adequate digital infrastructure and opportunities for teacher professional development. Considering the limitations of the one-group pretest-posttest design, future research is recommended to employ experimental or quasi-experimental designs involving control groups and larger samples. Further studies may also investigate the long-term effects of Google Arts and Culture on students' learning outcomes, creativity, cultural awareness, and digital literacy across different educational contexts.

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