

## Google Sites-Based Interactive Multimedia to Improve Social Studies Learning Outcomes for Fourth-Grade Elementary School Students

Arita Marini <sup>1</sup>, Desy Safitri <sup>2</sup>, Gusti Yarmi <sup>3</sup>, Syafrili Ardina Mutiara <sup>4</sup>

<sup>1</sup> Department of Elementary School Teacher Education Department, Universitas Negeri Jakarta, Indonesia.

Email: aritamardini@unj.ac.id

<sup>2</sup> Department of Social Science Education Department, Universitas Negeri Jakarta, Indonesia. Email: desysafitri@unj.ac.id

<sup>3</sup> Department of Elementary School Teacher Education Department, Universitas Negeri Jakarta, Indonesia. Email: gyarmi@unj.ac.id

<sup>4</sup> Department of Elementary School Teacher Education Department, Universitas Negeri Jakarta, Indonesia.

Email: syafrili3225@gmail.com

### KEYWORDS

Google Sites, interactive multimedia, social studies, learning outcomes, elementary school

### ABSTRACT

This study investigated the impact of Google Sites-based interactive multimedia on enhancing learning outcomes in social studies among elementary school students. Employing the research and development (R&D) method, the study followed the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The research adopted a one-group pretest-posttest design, where a single sample group underwent treatment, with their performance evaluated before and after the intervention. The population was elementary school students in the Cakung sub-district, East Jakarta, Indonesia. Using the Slovin formula, a random sample of 32 fourth-grade students was selected as the practical group. Hypothesis testing was conducted using a t-test through SPSS 29, which revealed a statistically significant improvement in learning outcomes, with both one-tailed and two-tailed p-values recorded at less than 0.001. These findings demonstrate that Google Sites-based interactive multimedia effectively enhances social studies learning outcomes for fourth-grade students in the Cakung sub-district, East Jakarta, Indonesia.

## 1. Introduction

Learning is an activity that involves individuals striving to gain knowledge, skills, and positive values through various resources. Active learning can be promoted by introducing new incentives, such as innovative learning environments and selecting suitable learning media aligned with the lesson plan. To achieve this, teachers must understand how to design engaging learning tools. These media are crucial in facilitating the teaching process and helping educators effectively deliver content toward specific objectives.

Learning media can spark interest and positively influence students' psychology, making them more enthusiastic during the learning process [1-7]. This is because learning media offers students fresh and engaging experiences. By incorporating diverse media, teachers can prevent monotonous lessons. Gagne (1970) supports this idea, highlighting that media consists of various components within the learning environment that motivate students to engage actively.

Advancements in technology have introduced a wide range of learning media available for teachers [8]. One innovative tool in the digital era is interactive multimedia based on Google Sites. Google Sites, a product of Google, is a user-friendly platform for creating websites. Its accessibility allows students to explore learning materials independently [9]. The platform is especially suitable for beginners due to its intuitive menus and features. Teachers can use Google Sites to incorporate materials, educational videos, evaluations, and quizzes.

Google Sites enables students to access teacher-prepared learning materials anytime and anywhere [10-13]. These resources are not limited to textbooks but may include content from the Internet or other references, broadening students' perspectives. For elementary students, parental guidance is essential to ensure focus and minimize distractions while accessing materials at home. Google Sites offers an effective solution for students to review content, particularly given the limited instructional time in school.

This research stands out from previous studies that lacked interactivity, often resulting in monotonous learning experiences and decreased student engagement. Student interest plays a critical role in enhancing learning outcomes. To address this, researchers developed media that utilize multiple applications, not just one. For instance, this study incorporates the Quizizz application, which includes gamified quizzes and evaluations to assess students' comprehension of the material. Additionally, YouTube videos are integrated to present the material visually and engagingly, increasing student interest and encouraging active class participation. This interactive approach helps improve student learning outcomes.

The research utilizes interactive multimedia combined with Google Sites to foster active involvement in the learning process. This approach is particularly relevant given the current emphasis on technology-based education. By introducing variations in media, the learning process becomes more dynamic and appealing, motivating students to engage actively and achieve better results.

The study examines using Google Sites-based interactive multimedia to enhance social studies learning outcomes for grade 4 elementary school students. It seeks to address the following questions:

- How can Google Sites-based interactive multimedia be effectively developed?
- Do students' social studies learning outcomes improve after using Google Sites-based interactive multimedia?

The primary objective of this study is to evaluate the effectiveness of integrating interactive multimedia with Google Sites for teaching social studies to elementary school students. Additionally, it aims to develop an innovative teaching approach using Google Sites, which inspires students to learn and fosters motivation. This research aspires to contribute to creating more engaging and innovative educational practices.

## **A. Interactive Multimedia**

The rapid advancement of science and technology significantly influences the educational process [14-16]. Education must adapt to foster and enhance students' life skills, especially 21st-century competencies such as technological proficiency. Consequently, teachers are expected to integrate technology into their teaching practices. Numerous technology-based learning tools are available, with interactive multimedia as one notable example.

Multimedia combines at least two input or output media [17-20]. These media can include audio (such as sound and music), animations, videos, text, graphics, and images. Multimedia enhances the delivery of educational material, addresses limitations related to space, time, and sensory capabilities, and encourages more active student participation in the learning process.

In education, "interactive" pertains to two-way communication [21-27]. This involves a reciprocal relationship or interaction between users and the media or application. Such interactions include displaying information, feedback on evaluation results, and more.

From the definitions above, interactive multimedia is a blend of various media forms—such as audio, animation, video, text, graphics, and images—integrated into digital formats. These tools are designed to convey information to audiences while enabling user interaction.

## **B. Learning Outcomes**

Achievements resulting from the learning process are referred to as learning outcomes [28]. These outcomes reflect the effectiveness of the learning process and are demonstrated by the test scores students receive from their teachers.

Student learning outcomes are influenced by both internal and external factors [29-30]. Internal factors originate within the individual, including innate abilities (talent), personal interests, motivation, and learning methods. On the other hand, external factors stem from the surrounding environment, such as

the school, family, and community. A positive environment fosters better learning outcomes, while a less favourable environment may negatively affect them.

Media use in the learning process can enhance students' interest and motivation [31-35]. Increased interest and motivation lead to improved learning outcomes. For this reason, teachers should incorporate engaging media to capture students' attention, encouraging active participation and better understanding of the material.

## 2. Method

The development of this research media follows the research and development approach, utilizing the ADDIE model (Analyze, Design, Develop, Implement, Evaluate). An experimental method was applied to determine its effectiveness. The study involved 32 fourth-grade students at Ujung Menteng 01 Elementary School in East Jakarta, divided into practical and control groups.

### A. Research Design

Table I. Experimental Design

Group	Treatment	Posttest
E	X	O <sub>1</sub>
C	-	O <sub>2</sub> _

Information:

E = Experimental group

C = Control group

O<sub>1</sub> = Posttest of the experimental group

O<sub>2</sub> = Posttest of control group

X = Google sites based interactive multimedia

### B. Population and Sample

This research centred on the vibrant elementary school community of Ujung Menteng 01 Elementary School, located in East Jakarta. Employing the Slovin formula for random sampling, the study meticulously selected 32 experimental and control students, ensuring a balanced and statistically sound representation.

### C. Research Instrument

This study employed a posttest instrument to evaluate students' cognitive abilities, focusing on their comprehension of the material and overall learning outcomes. After the experimental treatment, a posttest was administered to the experimental and control groups. By juxtaposing the post-test results, the study aimed to delineate the impact of the treatment, revealing significant differences that highlight its effectiveness.

### D. Data Analysis

Rigid tests were conducted to ensure the validity of the data for the statistical analysis. The Kolmogorov-Smirnov test was employed to assess the normality of the data distribution, while Levene's test verified the homogeneity of variance. Inferential statistical methods, particularly the t-test, were utilized for hypothesis testing. Conclusions were drawn based on a significance threshold 0.05, providing a robust foundation for interpreting the results.

### 3. Results and Discussions

#### A. Google Sites-based interactive multimedia development

The interactive multimedia display, created using Google Sites, seamlessly integrates various elements such as YouTube videos and Quizizz for evaluation purposes. This innovative platform provides students with direct access to engaging video content while also including a Quizizz link to enhance their learning experience. The homepage of this multimedia tool, as shown in Fig. 1., reflects the researcher's effort to create an engaging and user-friendly interface for effective learning.



Fig. 1 Home page

The homepage is divided into three main sections: the material page, the video page, and the quiz page. Upon accessing the homepage, students are guided to proceed to the next page, where they can choose their desired section. Whether they explore the materials, watch the videos, or test their knowledge with the quiz, each path offers a tailored learning experience. For instance, if students select the material section, they will encounter a page similar to the one illustrated in Fig. 2.



Fig. 2 Material page

The material page presents students with an additional menu to guide further exploration. This page provides access to various topics and includes detailed explanations of the selected material when students choose a specific section. There are four main material options to explore: the definition of cultural diversity, its causes, the types of cultural diversity, and strategies for preserving cultural heritage. If students decide to return to the homepage and select the video option instead, they are redirected to a dedicated page featuring an engaging learning video about cultural diversity, as depicted in Fig. 3.





Fig. 3 Material page

If students opt for the Quiz option on the homepage, they will be taken to a page featuring a direct link to Quizizz, as illustrated in Fig. 3. On this Quizizz page; students have the opportunity to assess their understanding by answering a series of interactive questions through the Quizizz application, as shown in Fig. 4. This feature provides an engaging and dynamic way for learners to evaluate their knowledge in an enjoyable format.



Fig. 4 Link Quiz page

## B. The effect of Google Sites-based interactive multimedia development on learning outcomes

The Shapiro-Wilk test was conducted to assess the normality of the data distribution. As shown in Table 2, this analysis was performed using SPSS 29, and the results confirmed that the data follows a normal distribution. Additionally, the homogeneity of the data was evaluated, with the results displayed in Table 3. This test was also carried out using SPSS 29, which indicated a significance value greater than 0.05, leading to the acceptance of H0. Therefore, it can be concluded that the data is homogeneous.

Table 2. Test of Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest	.958	32	.246
Posttest	.913	32	.013

Table 3. Homogeneity test results

	Levene Statistic	df1	df2	Sig.
Based on Mean	.014	1	62	.908
Based on Median	.003	1	62	.956
Based on Median and with adjusted df	.003	1	61.709	.956
Based on trimmed mean	.006	1	62	.938

The researcher further employed a t-test to examine the significance level of the results, with the analysis conducted using SPSS 29 and summarized in Table 4. The findings revealed a significant difference in the learning outcomes between the experimental class, which was exposed to Google Sites-based multimedia, and the control class, which did not receive this treatment. Consequently, the null hypothesis was rejected, confirming the effectiveness of the multimedia intervention in enhancing learning outcomes.

Table 4. T-Test results

Paired Differences					t	df	Significance	
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
			Lower	Upper				
Based on Median and with adjusted df	.003	1	-18.115	-13.198	-12.989	31	<.001	<.001

Table 4 shows that implementing Google Sites-based interactive media can improve social studies learning outcomes for 4th-grade elementary school students at Ujung Menteng 01 Elementary School, East Jakarta, Indonesia. With this, the research can be declared successful because Google Sites-based interactive media can significantly impact student learning outcomes. Thus, using Google Sites-based interactive media for online learning today is essential, especially in social studies.

This research can strengthen previous studies and confirm that Google Sites-based interactive media can improve social studies learning outcomes for 6th-grade elementary school students. This is consistent with prior research, which found that interactive media can improve student learning outcomes [36-37]. Using the media can affect good student learning outcomes in the current digital era. In the digital era, students are likelier to like technology-related things in games and learning.

Furthermore, students' cognitive abilities can also be improved by using interactive learning media [38-40]. Students who use interactive learning resources can become more engaged and less bored. Interactive learning resources are necessary to help students comprehend the material, particularly in social classes with thick subject matter. By utilizing technology as a tool for content delivery, educators can produce interactive learning materials that facilitate students' comprehension of the topic. Learning media aims to optimize the achievement of learning objectives while offering students meaningful learning experiences. In the modern era, these media are often closely tied to technological advancements and global developments [41-67].

Using Google Sites-based interactive media can produce considerable benefits compared to traditional learning methods. Interactive media has advantages and is an excellent fit for online learning today. Interactive media in the classroom can boost students' drive to learn, encourage greater student participation, and expand their knowledge [68-91]. Classroom learning activities are altered for the students, particularly when Google Sites-based interactive media is used. The modifications made have a very favourable impact on learning outcomes and how instruction and learning activities are carried out in the classroom. Learning and teaching activities online today make it difficult for teachers to provide suitable learning media to students. However, the solution of giving Google Sites-based interactive media can be applied to learning, especially in the context of social lessons in elementary schools.

#### **4. Conclusions**

The findings reveal a significant difference in learning outcomes between the experimental class, which benefited from this innovative approach, and the control class, which followed conventional methods without specialized treatment. This indicates that Google Sites-based interactive media has a positive and measurable impact on the social studies learning outcomes of 4th-grade students at Ujung Menteng 01 Elementary School, East Jakarta. Given these results, it is strongly recommended that Google Sites-based interactive media be adopted in elementary schools. Its application can effectively enhance student engagement and improve learning outcomes, making it a valuable tool for modern education.

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